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THE TRANSACTIONS

OF THE

EDINBURGH OBSTETRICAL SOCIETY.

VOL. XXV.

SESSION 1899-1900.

EDINBURGH: OLIVER AND BOYD
PUBLISHERS TO THE SOCIETY
1900.

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PREFACE.

THIS, the twenty-fifth volume of the Society's Transactions, contains a record of its proceedings during the Session 1899–1900.

In it, as in former volumes, the views brought forward in the Papers are to be considered as those of the writers themselves, and not as those of the Society as a body.

THE EDITOR.

October 1900

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	William Marshall, L.R.C.S. Ed., *Milnathort*,	1884
	William Richardson, M.D., F.R.C.S. Ed., *Bristol*,	1884
	Fourness Barrington, M.B., F.R.C.S. Eng., *Sydney, Australia*,	1884
	*Francis William Nicol Haultain, M.D., F.R.C.P. Ed.,	1884
110	*John Struthers Stewart, L.R.C.P. & S. Ed.,	1884

		Date of Admission.
	Alexander Campbell, M.D., F.R.C.S. Ed., *Dundee*,	1885
	Charles Batten Gracie, L.R.C.P. Ed., M.R.C.S. Eng., *Burntisland*,	1885
	Frederick Anastasius Saunders, F.R.C.S. Ed., L.R.C.P. Ed., *Grahamstown, South Africa*,	1885
	John Smith, M.D., M.R.C.S. Eng., *Kirkcaldy*,	1885
115	Allan Cuthbertson Sym, M.D., C.M.,	1885
	Frederick J. Underhill, F.R.C.S. Ed., L.R.C.P. Ed., *British Columbia*,	1885
	William Gayton, M.D., M.R.C.P.L., M.R.C.S. Eng., *London*,	1885
	*Alexander Matthew, F.R.C.S. Ed., *Corstorphine*,	1885
	Alexander Somerville Cumming, M.D., F.R.C.P. Ed.,	1885
120	Gustave Michael, M.B., C.M., *London*,	1885
	*James Haig Ferguson, M.D., F.R.C.P. Ed., M.R.C.S. Eng.,	1885
	John Edward Gemmell, M.B., C.M., *Liverpool*,	1885
	Robert Stewart, M.B., C.M.,	1885
	Surgeon-Captain Robert Charles Macwatt, M.B., B.Sc., C.M., 7th Bengal Cavalry, *Bombay*,	1885
125	*E. H. Lawrence Oliphant, M.D., C.M., *Glasgow*,	1885
	Andrew Wallace Walker, L.R.C.P. Ed., L.F.P. & S. Glasg.,	1886
	James Hogarth Pringle, M.B., F.R.C.S. Eng., *Glasgow*,	1886
	Walter Blake Nisbet, M.B., C.M., *N. Queensland*,	1886
	Robert Swan Aitchison, M.D., F.R.C.P. Ed.,	1886
130	John Walton Hamp, L.F.P. & S. Glasg., L.S.A., *Wolverhampton*,	1886
	John Dickinson Leigh, M.B., C.M., *Scarboro'*,	1886
	James Auriol Armitage, M.D., C.M., *Wolverhampton*,	1886
	William Henry Miller, M.D., F.R.C.P. Ed.,	1886
	John M'Call, L.R.C.P. Ed.,	1886
135	Thomas Wood, M.B., C.M.,	1886
	F. E. Drumheller, M.D., *Sunbury, Pennsylvania*,	1887
	Hugh M'Callum, L.R.C.P. & S. Ed., *Kinloch-Rannoch*,	1887
	Nutting Stuart Fraser, M.B., M.R.C.S. Eng., *St John's, Newfoundland*,	1887
	Augustus Alexander Matheson, M.D., F.R.C.P. Ed.,	1887
140	Robert Mackenzie, M.D., C.M.,	1887
	Simon Linton, M.B., C.M., *Grangemouth*,	1887
	Thomas Jackson Thyne, M.B., F.R.C.P. Ed.,	1887
	W. Burns Macdonald, M.B., C.M., *Dunbar*,	1887
	John St Clair Boyd, M.D., M.Ch., *Belfast*,	1887
145	Briton Smallman Robson, M.B., C.M., *Newcastle-on-Tyne*,	1887
	Ernest T. Roberton, M.D., M.R.C.S. Eng., *New Zealand*,	1887
	*Samuel Sloan, M.D., F.F.P. & S. Glasg., *Glasgow*,	1887
	James Wm. Fox, L.R.C.P. & S. Ed., *London*,	1887
	John Frederick Sturrock, M.B., C.M., *Broughty-Ferry*,	1887
150	Alexander Primrose, M.B., M.R.C.S. Eng., *Toronto, Canada*,	1887
	Arthur Perigal, M.D., M.R.C.S. Eng., *New Barnet, Herts*,	1887
	James Aitken Clark, M.B., C.M.,	1887
	Edward Carmichael, M.D., F.R.C.P. Ed.,	1887
	Percival Humble Watson, M.R.C.S. Eng., L.R.C.P. Ed. *Newcastle-on-Tyne*,	1887
155	Charles Clark Teacher, M.B., C.M.,	1887
	Robert Inch, M.B., C.M., *Gorebridge*,	1887
	Ellis Thomas Davies, M.D., M.R.C.S. Eng., *Liverpool*,	1887
	John Orr, M.B., C.M., *Eccles, Lancashire*,	1887
	*George Owen Carr Mackness, M.D., C.M., *Broughty-Ferry*,	1887
160	Francis Joseph Baildon, M.B., C.M., *Southport*,	1887
	Surgeon-Lt. Ralph H. Maddox, M.B., M.R.C.S. Eng., I.M.S., *Bengal*,	1887
	James Williamson Martin, M.D., F.R.C.P. Ed., *Dumfries*,	1887
	James Andrew Blair, M.D., C.M., D.Sc., *Newcastle-on-Tyne*,	1887
	*John Thomson, M.D., F.R.C.P. Ed.,	1887
165	Robert Kirk, M.D., F.R.C.S. Ed., *Bathgate*,	1887

		Date of Admission.
	*William Fraser Wright, M.B., C.M., *Leith*,	1887
	Alexander Bruce, M.D., F.R.C.P. Ed.,	1887
	Richard Joseph Tristan, L.R.C.P. & S. Ed., *Retford, Notts*,	1887
	Robert Henry Blaikie, M.D., F.R.C.S. Ed.,	1888
170	James Hutcheson, M.D., F.R.C.S. Ed.,	1888
	A. A. Jervis Pereira, M.D., *Delagoa Bay*,	1888
	Christopher Martin, M.B., F.R.C.S. Eng., *Birmingham*,	1888
	John George Havelock, M.D., C.M., *Montrose*,	1888
	John Pirie, M.B., C.M.,	1888
175	James Gibson Graham, M.B., C.M., *Glasgow*,	1888
	Robert Adams Brewis, M.D., C.M., *Dursley*,	1888
	John Allison, M.D., C.M., *Kettering, Northampton*,	1888
	Archibald Cowan Guthrie, M.B., C.M.,	1888
	Samuel Beatty, M.B., C.M., *Pitlochry*,	1888
180	Professor James Chalmers Cameron, M.D., *Montreal*,	1888
	Albert Edward Morison, M.B., F.R.C.S. Ed., M.R.C.S. Eng., *West Hartlepool*,	1888
	George H. Temple, M.B., C.M., *Weston-super-Mare*,	1888
	Norman L. Boxill, M.B., C.M., *Barbados*,	1888
	John Hunter Helm, M.B., C.M., *Ratho*,	1888
185	George Scott MacGregor, M.D., C.M., *Glasgow*,	1888
	William Sneddon, M.B., C.M., *Cupar-Fife*,	1888
	Thomas Watts Eden, M.B., C.M., *London*,	1888
	William Fordyce, M.D., F.R.C.P. Ed.,	1888
	Charles E. Harvey, M.B., M.R.C.S. Eng., *Sav-la-Mar, Jamaica*,	1889
190	Frederick E. Welby, F.R.C.S. Ed., *St Helena*,	1889
	Alexander Lang Murray, L.R.C.P. & S. Ed.,	1889
	George Pirrie Boddie, M.B., C.M.,	1889
	James F. W. Ross, M.D., *Toronto, Canada*,	1889
	J. Stuart Nairne, F.R.C.S. Ed., F.F.P. & S. Glasg., *Glasgow*,	1889
195	John David Williams, M.D., C.M., *Cardiff*,	1889
	James S. Fox, M.B., M.R.C.S. Eng., *St Helens*,	1889
	S. M'Murtry, M.D., *Louisville, Kentucky, U.S.A.*,	1889
	Hugh Jamieson, M.D., C.M.,	1889
	Thomas Wm. Nassau Greene, L.R.C.P. Ed., L.R.C.S.I., *Carlow*,	1889
200	John Clarence Webster, M.D., F.R.C.P. Ed., *Chicago*,	1889
	William George Aitchison Robertson, M.D., F.R.C.P. Ed.,	1889
	William Basil Orr, M.D., C.M.,	1889
	*Edward Farr Armour, M.B., C.M.,	1889
	George Wilkinson, M.D., C.M., *Liverpool*,	1889
205	James Lamond Lackie, M.D., F.R.C.P. Ed.,	1889
	James Wilson, M.B., C.M.,	1889
	Archibald Maclean, M.D., C.M., *Kilmarnock*,	1890
	Frederick William Lyle, M.D., C.M., *London*,	1890
	Thomas Dobson Poole, M.D., C.M., *St Anne's-on-the-Sea*,	1890
210	Walter Scott Gibson, M.B., C.M., *London*,	1890
	Charles Newberry Cobbett, M.D., C.M., *London*,	1890
	Alexander William Gordon Price, M.B., C.M.,	1890
	Hugh Shapter Robinson, M.R.C.S. Eng., L.R.C.P. Ed., *London*,	1890
	George Matheson Cullen, M.D., C.M.,	1890
215	Frederick Albert L. Lockhart, M.B., C.M., *Montreal, Canada*,	1890
	Edmund Frederick Tanney Price, M.B., C.M.,	1890
	Ernest Theophilus Roberts, M.D., C.M., *Keighley*,	1890
	Owen Foulkes Evans, M.D., C.M., *Liverpool*,	1890
	James Duncan Farquharson, M.B., C.M., *Newcastle-on-Tyne*,	1890
220	William Smith, L.R.C.P. & S. Ed.,	1890
	Harvey Littlejohn, M.B., F.R.C.S. Ed.,	1890
	Carstairs Cumming Douglas, M.D., C.M., *Glasgow*,	1890
	Robert Wise, M.D., C.M., *London*,	1890
	William Russell, M.D., F.R.C.P. Ed.,	1890

		Date of Admission.
225	Alexander Scott Duncan, M.B., C.M., *London*,	1890
	Prof. William Keiller, F.R.C.S. Ed., *Galveston, Texas, U.S.A.*,	1890
	Michael Dewar, M.D., C.M.,	1891
	Gains T. Smith, M.D., *Moncton, New Brunswick*,	1891
	John Hugh Alexander Laing, M.B., C.M.,	1891
230	Robert Thin, M.B., F.R.C.P. Ed.,	1891
	Alexander H. Vassie, M.B., C.M., *London*,	1891
	James Harvey, M.D., C.M.,	1891
	Alexander Henderson, M.B., C.M.,	1891
	James Smith, M.B., C.M.,	1891
235	George Balfour Marshall, M.D., C.M., *Glasgow*,	1891
	William Booth, F.R.C.S. Ed.,	1891
	Richard T. Yoe, M.D., *Louisville, Kentucky, U.S.A.*,	1891
	Alexander Bruce Giles, M.D., C.M.,	1891
	Hamilton Graham Langwill, M.D., F.R.C.P. Ed., *Leith*,	1891
240	Herbert Ernest Lee, M.B., C.M., *Australia*,	1891
	Charles Martin, M.B., C.M., *Newton Abbot*,	1892
	William Murray Cairns, M.B., C.M., *Liverpool*,	1892
	Robert Dundas Helm, M.D., C.M., *Carlisle*,	1892
	William Wood, M.B., C.M.,	1892
245	James Thomas Moore Giffen, F.R.C.S. Ed., *Chester*,	1892
	John Alexander Robertson, M.B., C.M., *Cape Colony*,	1892
	Frank Dendle, M.B., C.M., *Dunfermline*,	1892
	Julius Henry Beilby, M.B., C.M., *Bromsgrove*,	1892
	Frederick Thomas Anderson, M.D., F.R.C.S. Ed., *Barnstaple*,	1892
250	J. Gordon Smith, L.R.C.P. & S. Ed., *West Africa*,	1892
	Simson Carstairs Fowler, M.B., C.M., *Juniper Green*,	1892
	Hugh Ernest Fraser, M.D., C.M., *Dundee*,	1892
	*Prof. John Alexander Campbell Kynoch, M.B., F.R.C.P. Ed., *Dundee*,	1892
	Alexander Brown Ritchie, M.B., C.M., *Hulme, Manchester*,	1892
255	Walter John Shaw, M.B., C.M., *Cockburnspath*,	1892
	Robert Stirling, M.D., C.M., *Perth*,	1892
	William Henry Vickery, F.R.C.S. Eng., L.R.C.P. Lond., *Newcastle-on-Tyne*,	1892
	William Ramsay Smith, M.B., C.M., *Australia*,	1892
	A. Watson Munro, M.D., *Sydney, Australia*,	1892
260	Charles Frederick Ponder, M.B., C.M., *Glasgow*,	1892
	John Tod, M.B., C.M., *Leith*,	1892
	Richard J. Erskine Young, M.D., C.M.,	1892
	George Thomas C. Adams, L.R.C.P. & S. Ed., *Melbourne, Aust.*,	1892
	George Henry Walter Smith, M.D., C.M., *Sydney, Australia*,	1892
265	John Lawson Dick, M.B., C.M., *Cape Colony*,	1892
	Charles Croomhall Easterbrook, M.D., C.M.,	1892
	Walter Petrie Simpson, M.B., C.M., *Coningsby*,	1892
	James Ernest Moorhouse, M.D., C.M., *Stirling*,	1892
	D. W. Johnston, F.R.C.S. Ed., *Johannesburg, South Africa*,	1892
270	David George Davidson, M.B., C.M.,	1892
	Allen Thomson Sloan, M.D., C.M.,	1893
	Robert Balfour Graham, F.R.C.S. Ed., *Leven, Fife*,	1893
	Albert Frederick Rosa, M.B., C.M.,	1893
	George Benjamin Mitchell, M.B., C.M., *Whitby*,	1893
275	H. Robins, M.D., *Jamaica*,	1893
	Linn J. Schofield, M.D., *Warrensburg, Mo., U.S.A.*,	1893
	David Milligan, M.B., C.M.,	1893
	George Morton Wilcockson, L.R.C.P. & S. Ed., *Reading*,	1893
	John MacRae, M.D., C.M., *Murrayfield*,	1893
280	Ernest Switzer Forde, L.R.C.P. & S. Ed., *Dalry, Galloway*,	1893
	George Wade, M.D., C.M., *Melrose*,	1893
	Philip Grierson Borrowman, M.B., C.M., *Crieff*,	1893
	John Liddell, M.D., C.M., *Harrogate*,	1893
	William Herbert Gregory, M.D., C.M., *Beverley, Yorks*	1893

		Date of Admission.
285	Cuthbert Christy, M.B., C.M., *Broomfield*,	1893
	James Gibson Cattanach, M.B., F.R.C.P. Ed.,	1893
	Alexander Maitland Easterbrook, M.B., C.M., *Gorebridge*,	1893
	Robert William Roberts, L.R.C.P. & S. Ed., *South Wales*,	1894
	Claude Buchanan Ker, M.D., C.M.,	1894
290	John Malcolm Farquharson, M.B., C.M.,	1894
	Charles Alexander Butchart, M.B., C.M.,	1894
	Frederick Maurice Graham, L.R.C.P. & S. Ed., *Market-Drayton*,	1894
	Robert Hoggan, M.B., C.M., *Liberton*,	1894
	James Livingstone Thompson, M.B., C.M., *Australia*,	1894
295	George Stevenson Shirt Hirst, M.B., C.M., *Withern*,	1894
	John Stevens, M.D., F.R.C.P. Ed.,	1894
	Charles Isodon Bodon, M.D., *Budapest*,	1894
	Hugh Lewis Hughes, L.R.C.P. & S. Ed., *Dowlais*,	1894
	Sylvanus Glanville Morris, M.D., C.M., *Nantgaredig*,	1894
300	Georges P. Coromilas, M.D., *Athens, Greece*,	1894
	Thomas Easton, M.D., C.M.,	1894
	David Robertson Dobie, M.D., C.M., *Coldstream*,	1894
	Gopal Govind Vatve, M.D., *Bombay*,	1894
	Robert William Beesley, M.D., C.M., *Bolton*,	1894
305	William A. Stephen, M.B., C.M., *Loftus-in-Cleveland*,	1894
	William Edward Fothergill, M.D., C.M., *Manchester*,	1894
	George Sandison Brock, M.D., C.M., *Rome*,	1894
	John M. Munro Kerr, M.B., C.M., *Glasgow*,	1894
	John Montgomery, M.B., C.M., *Birmingham*,	1895
310	Robert Cochrane Buist, M.D., C.M., *Dundee*,	1895
	Robert Thomson Ferguson, M.B, C.M., *Anstruther*,	1895
	William Henry Stephenson, L.R.C.P.& S.Ed., L.F.P.& S.Glasg., *Manchester*,	1895
	Angus Vallance MacGregor, M.D., C.M., *Hartlepool*,	1895
	Charles William Donald, M.B., C.M.,	1895
315	Oguntola Sapara, L.R.C.P. & S. Ed., *Lagos, W. Africa*,	1895
	John Struthers, M.B., C.M., *Transkei, South Africa*,	1895
	B. W. Broad, M.B., C.M., *Cardiff*,	1895
	Edwin Hindmarsh, M.B., C.M., *Bengal*,	1895
	Patrick Mackin, L.R.C.P. & S. Ed., *New Zealand*,	1895
320	G. Edgar Helme, M.B., C.M., *Manchester*,	1895
	John Hosack Fraser, M.B., F.R.C.P. Ed., *Bridge of Allan*,	1895
	Stewart Grant Ogilvy, M.B., C.M.,	1895
	Thomas Howard Morgan, M.D., F.R.C.S. Ed., *Queensland, Aust.*,	1895
	William Macrae Taylor, M.B., F.R.C.S. Ed.,	1895
325	David James Graham, M.D., C.M.,	1895
	Walter William Chipman, M.D., C.M., F.R.C.S.Ed., *Montreal*,	1895
	John Cumming, F.R.C.S. Ed., L.R.C.P. & S. Ed.,	1896
	Sol Jervois Aarons, M.D., C.M., *London*,	1896
	Robert Beveridge, M.B., C.M., *Leith*,	1896
330	John Anderson, M.B., C.M., *Pitlochry*,	1896
	Thomas John Burton, M.D., C.M., *Bearsden*,	1896
	Robert M. Leith, M.B., C.M., *Port Elizabeth, Cape Colony*,	1896
	Robert Gordon M'Kerron, M.B., C.M., *Aberdeen*,	1896
	Donald George Gordon Macdonald, M.D., C.M., *Aberdeen*,	1896
335	Frederick John M'Cann, M.D., M.R.C.P.L., *London*,	1896
	David Robert Taylor, L.R.C.P. & S.Ed., *Ayton*,	1896
	James Curtis Whyte, M.D., C.M., *Dalkeith*,	1896
	George William Simla Paterson, M.B., C.M.,	1896
	William Robert Martine, M.B., C.M., *Haddington*,	1896
340	Robert Henry Watson, M.D., C.M., *Hamilton*,	1896
	Thomas Marshall Callender, M.D., C.M., *Sidcup*,	1896
	Lewis Grant, M.B., C.M., *Neston*,	1896
	Robert Robertson, M.B., C.M.,	1897
	James Wilkie, L.R.C.P., & S. Ed., *Portobello*,	1897
345	Andrew Graham, M.D., *Currie*,	1897

		Date of Admission.
	Douglas Chalmers Watson, M.B., C.M.,	1897
	Robert Mair, M.D., C.M., *Hawick*,	1897
	Roderick Murdoch Matheson, M.D., C.M., *Isle of Man*,	1897
	Robert Jardine, M.D., F.F.P.S.Glasg., M.R.C.S.Eng., *Glasgow*,	1897
350	Daniel Charles Edington, M.B., C.M., *Penrith*,	1897
	Edwin Arthur Gibson, M.B., C.M., *Glasgow*,	1897
	John Macmillan, M.D., F.R.C.P. Ed.,	1897
	Harold Sherman Ballantyne, M.B., C.M., *Dalkeith*,	1897
	Ernest Edward Porrit, M.B., F.R.C.S.E., *New Zealand*,	1897
355	William John Garbutt, M.B., C.M., *Birmingham*,	1897
	Henry John Forbes Simson, M.B., F.R.C.S. Ed.,	1897
	William Herbert Goldie, M.D., C.M., *Auckland, New Zealand*,	1897
	Charles Minor Cooper, M.B., Ch.B.,	1897
	William Alexander Potts, M.D., C.M., *Birmingham*,	1897
360	Angus Macdonald, M.B., C.M.,	1897
	Bernard Samuel Story, M.D., F.R.C.S.E., *Annfield Plain*,	1898
	Alexander Macdonald, M.B., C.M.,	1898
	George Robert Livingston, M.B., C.M., *Dumfries*,	1898
	Charles Carmichael Forrester, M.B., C.M.,	1898
365	William Morrison Milne, M.B., C.M.,	1898
	Percival George Bannister, M.D., C.M.,	1898
	William Joseph Murphy Barry, M.D., M.R.C.P. Ed., *Dublin*,	1898
	Harold Malcolmson, M.B., C.M., *Holywood, Co. Down*,	1898
	John Christie Forbes, L.R.C.P. & S. Ed., *Liberton*,	1898
370	Alexander Cruikshank Ainslie, M.B., C.M.,	1898
	Henry Aylmer Dumat, M.D., C.M., *Durban, South Africa*,	1898
	Gabriel Maurange, M.D., *Paris*,	1898
	John Thomas Woodside, L.R.C.P. & S. Ed., *Holywood*,	1898
	George Freeland Barbour Simpson, M.B., Ch.B.,	1898
375	Alfred Charles Sandstein, M.B., Ch.B.,	1898
	Alfred Shearer, M.B., Ch.B.,	1898
	John Henry Rhodes, M.B., Ch.B., *Birmingham*,	1898
	James Duncan Slight, M.D., Ch.B., *Portobello*,	1898
	Francis John Harvey Bateman, M.B., C.M., *Norwich*,	1898
380	Robert John Johnston, M.B., C.M.,	1899
	George Lyall Chiene, M.B., C.M.,	1899
	Percy Theodore Herring, M.D., C.M.,	1899
	William Bertie Mackay, M.D., *Berwick-on-Tweed*,	1899
	James Kennedy Drysdale, M.B., C.M.,	1899
385	Carel Hendrick Krüger, M.D., F.R.C.S. Ed., *Cape Colony*,	1899
	Captain Patrick Wilkins O'Gorman, M.D., D.P.H., *India*,	1899
	Edward William Scott Carmichael, M.D., F.R.C.S. Ed.,	1899
	James Wilson M'Brearty, F.R.C.S. Ed., L.R.C.P. Ed., *New Zealand*,	1899
	John D. Cameron, M.D., *Montreal*,	1899
390	George Crewdson Thomas, M.B., C.M., *London*,	1899
	John Eason, M.B., M.R.C.P. Ed., *Leith*,	1899
	William John Barclay, M.B., Ch.B.,	1899
	Frederick Adolphus Fleming Barnardo, M.B., Ch.B., *Bournemouth*,	1899
	Alexander Dingwell Fordyce, M.B., Ch.B.,	1899
395	William Thomas Ritchie, M.D., C.M.,	1899
	Thomas Henry O'Reilly, L.R.C.P. & S. Ed., *Auckland, New Zealand*,	1899
	Owen, St John Moses, M.D., C.M., B.Sc., *London*,	1900
	Charles Wakeham Holmested, L.R.C.P. & S. Ed., L.F.P.S. Glasg., *Tuxford*,	1900
	Donald Macgregor, M.D., C.M., *Jedburgh*.	1900
400	Harry Oliphant Nicholson, M.B., C.M.,	1900

ORDINARY FELLOWS.

ARRANGED ALPHABETICALLY.

(*a.*) LIFE MEMBERS.

		Date of Admission.
	Anderson, Dr John, Pitlochry,	1896
	Barbour, Dr A. H. Freeland, 4 Charlotte Square,	1879
	Craig, Dr William, 71 Bruntsfield Place,	1870
	Croom, Dr J. Halliday, 25 Charlotte Square,	1870
5	Cumming, Dr John, 20 Gilmore Place,	1896
	Dumat, Dr Henry Aylmer, 7 Devonshire Place, Durban, Natal, South Africa,	1898
	Hart, Dr D. Berry, 29 Charlotte Square,	1877
	Johnston, Dr D. W, P.O. Box 2022, Johannesburg, Transvaal,	1892
	Martin, Dr Christopher, Cleveland House, George Road, Edgbaston, Birmingham,	1888
10	Morgan, Dr T. H., Gympie, Queensland, Australia,	1895
	Ponder, Dr Charles F., 5 Ailsie Drive, Langside, Glasgow,	1892
	Ranking, Dr J. E., Tunbridge Wells,	1881
	Ross, Dr James F. W., 481 Sherbourne Street, Toronto, Canada,	1889
	Simpson, Professor A. R., 52 Queen Street,	1858
15	Simpson, Dr G. F. Barbour, 5 Randolph Crescent.	1898
	Struthers, Dr John, Nqamakwe, Transkei, South Africa,	1895
	Vatve, Dr Gopal Govind, care of H.H. The Rajah of Miraj, Bombay, India,	1894
	Williams, Dr John D., 20 Windsor Place, Cardiff,	1889

(*b.*) ANNUAL SUBSCRIBERS.

	Aarons, Dr S. J., 14 Stratford Place, London, W.,	1896
20	Adam, Dr George Rothwell, Carlton House, Hotham Street, East Melbourne, Australia,	1879
	Adams, Dr George T. Cooke, 58 Collins Street, Melbourne, Victoria, Australia,	1892
	Affleck, Dr J. O., 38 Heriot Row,	1869
	Ainslie, Dr A. C., 20 Newington Road,	1898
	Aitchison, Dr R. S., 74 Great King Street,	1886
25	Alexander, Dr W. B., 8 Blenheim Place,	1882
	Allison, Dr J., Fuller House, Kettering, Northampton,	1888
	Anderson, Dr Fred. T., Boutport Street, Barnstaple, Devonshire,	1892
	Andrew, Dr James, 2 Atholl Crescent,	1868
	Archibald, Dr J., Hazelden, Wimbourne Road, Bournemouth,	1877
30	Armitage, Dr J. A., 28 Waterloo Road South, Wolverhampton,	1886
	Armour, Dr E. F., 149 Bruntsfield Place,	1889
	Badger, Dr W., Penicuik,	1880
	Baildon, Dr F. J., 42 Hoghton Street, Southport,	1887
	Balfour, Dr Andrew, 23 Abercorn Terrace, Portobello,	1877
35	Ballantyne, Dr A., Dalkeith,	1870
	Ballantyne, Dr H. S., Dalkeith,	1897
	Ballantyne, Dr J. W., 24 Melville Street,	1883
	Bannister, Dr P. G.,	1898
	Barclay, Dr W. J., Royal Infirmary,	1899
40	Barnardo, Dr F. A. F., Surrey Road, Bournemouth,	1899
	Barrington, Dr Fourness, 213 Macquarrie Street, Sydney, Australia,	1884
	Barry, Dr W. J. M., 72 Lower Baggott Street, Dublin,	1898
	Bateman, Dr F. J. Harvey, Upper St Giles Street, Norwich,	1898

		Date of Admission.
	Beatty, Dr Samuel, Craigvar, Pitlochry,	1888
45	Beesley, Dr R. W., 135 Deane Road, Bolton,	1894
	Beilby, Dr Julius H., 39 High Street, Bromsgrove,	1892
	Bell, Dr J. Lumsden, Driffield, Yorkshire,	1884
	Bell, Dr Robert, 29 Lynedoch Street, Glasgow, W.,	1878
	Bentley, Dr G. H., Kirkliston,	1877
50	Beveridge, Dr Robert, 9 James Place, Leith,	1896
	Black, Dr Alexander, 13 Howe Street,	1881
	Black, Dr J. Watt, 15 Clarges Street, Piccadilly, London, W.,	1863
	Blaikie, Dr R. H., 42 Minto Street,	1888
	Blair, Dr J. A., 16 Windsor Terrace, Newcastle-on-Tyne,	1887
55	Bleloch, Dr A., 2 Lonsdale Terrace,	1876
	Boddie, Dr G. P., 73 Bruntsfield Place,	1889
	Bodon, Dr Károly, Budapest, VI., Hajós-utcza, 15, Hungary,	1894
	Booth, Dr William, 2 Minto Street,	1891
	Borrowman, Dr Philip G., Viewfield, Crieff,	1893
60	Boxill, Dr N. L., Buttalls, St George, Barbados,	1888
	Boyd, Dr J. St Clair, 27 Victoria Place, Belfast,	1887
	Brewis, Dr N. T., 23 Rutland Street,	1883
	Brewis, Dr R. Adams, Reine Barnes, Dursley, Gloucestershire,	1888
	Broad, Dr B. W., The Sanitorium, Cardiff,	1895
65	Brock, Dr G. Sandison, Via Veneto, B. Rome,	1894
	Brodie, Dr W. Haig, Battle, Sussex,	1881
	Bruce, Dr Alexander, 8 Ainslie Place	1887
	Buist, Dr J. W., 1 Clifton Terrace,	1877
	Buist, Dr R. C., 166 Nethergate, Dundee,	1895
70	Burton, Dr Thomas J., Lonsdale, Bearsden, Glasgow,	1896
	Butchart, Dr C. A., 52 Leith Walk, Leith,	1894
	Cairns, Dr W. Murray, 67 Catherine Street, Liverpool,	1892
	Calder, Dr H. L., 60 Leith Walk, Leith,	1882
	Callender, Dr T. M., Wylverley, Sidcup,	1896
75	Cameron, Prof. James C., M.D., 941 Dorchester St., Montreal,	1888
	Cameron, Dr John D., 2068 St Catherine St., Montreal, Canada,	1899
	Campbell, Dr Alexander, 1 Clarendon Terrace, Dundee,	1885
	Carmichael, Dr Edward, 21 Abercromby Place,	1887
	Carmichael, Dr E. W. Scott, 22 Northumberland Street,	1899
80	Carmichael, Dr James, 22 Northumberland Street,	1871
	Cattanach, Dr J. G., 3 Alvanley Terrace,	1893
	Chiene, Dr George L., 26 Charlotte Square,	1899
	Chipman, Dr W. W., Royal Victoria Hospital, Montreal, Canada,	1895
	Christy, Dr Cuthbert, Pryors, Broomfield, Essex,	1893
85	Church, Dr H. M., 36 George Square,	1875
	Clark, Dr J. A., 4 Cambridge Street,	1887
	Cobbett, Dr C. N., 29 Rosslyn Hill, Hampstead, London, N.W.,	1890
	Connel, Dr J., Peebles,	1869
	Cooper, Dr C. M.,	1897
90	Coromilas, Dr Georges P., 67 Minerva Street, Athens, Greece,	1894
	Cox, Dr Joshua J., Cromwell Chambers, 38 Deansgate, Manchester,	1876
	Croudace, Dr J. H., Foregate House, Stafford,	1878
	Cullen, Dr G. M., 48 Lauriston Place,	1890
	Cumming, Dr A. S., 18 Ainslie Place,	1885
95	Currie, Dr A. S., 81 Queen's Road, Finsbury Park, London, N.,	1882
	Darling, Dr T. Brown, 13 Merchiston Place,	1884
	Davidson, Dr D. G., 9 Granville Terrace,	1892
	Davies, Dr E. T., 97 Shaw Street, Liverpool,	1887
	Dendle, Dr Frank, 2 Chalmers Street, Dunfermline	1892
100	Deverell, Dr H. C., 12 Windsor Street,	1882
	Dewar, Dr M., 24 Lauriston Place,	1891
	Dick, Dr J. L. Cradoch, Cape Colony, South Africa,	1892

		Date of Admission.
	Dickson, Dr George, 9 India Street,	1867
	Dobie, Dr D. Robertson, Coldstream,	1894
105	Donald, Dr C. W., 11 Braid Road,	1895
	Douglas, Dr Carstairs, 2 Royal Crescent, Glasgow, W.,	1890
	Drumheller, Dr F. E., 406 Market St., Sunbury, Pennsylvania,	1887
	Drysdale, Dr James K., 22 Coltbridge Terrace,	1899
	Duncan, Dr A. J., 158 Nethergate, Dundee,	1879
110	Duncan, Dr A. S., 9 Newlands Park, Sydenham, London, S.E.,	1890
	Dunlop, Dr H. M., 20 Abercromby Place,	1884
	Dunsmure, Dr J., 53 Queen Street,	1876
	Eason, Dr John, 196 Newhaven Road, Leith,	1899
	Easterbrook, Dr A. M., Gorebridge,	1893
115	Easterbrook, Dr C. C., Craig House, Morningside,	1892
	Easton, Dr Thomas,	1894
	Eden, Dr T. Watts, 49 Queen Anne Street, Cavendish Square, London, W.,	1888
	Edington, Dr D. C., 4 Portland Place, Penrith,	1897
	Elder, Dr W. Nicol, 6 Torphichen Street,	1879
120	Evans, Dr O. F., 71 Mulgrave Street, Liverpool,	1890
	Farquharson, Dr J. D., 242 Westgate Road, Newcastle-on-Tyne,	1890
	Farquharson, Dr J. M., 2 Coates Place,	1894
	Felkin, Dr R. W., 6 Crouch Hall Road, London, N.,	1884
	Ferguson, Dr J. Haig, 25 Rutland Street,	1885
125	Ferguson, Dr R. T., Anstruther, Fife,	1895
	Finlay, Dr W. A., St Helen's, Russell Place, Trinity,	1880
	Forbes, Dr J. C., Northfield, Liberton,	1898
	Forde, Dr E. S., Dalry, Galloway,	1893
	Fordyce, Dr A. Dingwall, 34 Great King Street,	1899
130	Fordyce, Dr William, 20 Charlotte Square,	1888
	Fothergill, Dr W. E., 200 Oxford Road, Manchester,	1894
	Forrester, Dr C. C., 12 Greenhill Place,	1898
	Foulis, Dr James, 34 Heriot Row,	1878
	Fowler, Dr Simson C., Juniper Green,	1892
135	Fox, Dr James S., 6 Baldwin Street, St Helen's,	1889
	Fox, Dr J. W., 68 Lupus Street, S. Belgravia, London, S.W.,	1887
	Fraser, Dr H. E., Royal Infirmary, Dundee,	1892
	Fraser, Dr J. Hossack, Fernfield, Bridge of Allan,	1895
	Fraser, Dr J. Joynor, Hessle, East Yorks,	1880
140	Fraser, Dr Nutting S., 205 Gower Street, St John's, Newfoundland,	1887
	Garbutt, Dr W. J., Farm Street, Birmingham,	1897
	Gayton, Dr William, Bartram Lodge, Fleet Road, Hampstead, London, N.W.,	1885
	Gemmell, Dr J. E., 12 Rodney Street, Liverpool,	1885
	Gibson, Dr E. Arthur, 2 Queen's Crescent, Glasgow, W.,	1897
145	Gibson, Dr W. Scott, 34 Dulwich Road, Herne Hill, London, S.E.,	1890
	Giffen, Dr J. T. M., 129 Boughton, Chester,	1892
	Giles, Dr A. B., 1 Kew Terrace,	1891
	Gilmour, Dr T. F., Port Ellen, Islay,	1882
	Goldie, Dr W. H., Auckland, New Zealand,	1897
150	Gracie, Dr C. B., Buccleuch Villa, Burntisland,	1885
	Graham, Dr A., Curriebank, Currie,	1897
	Graham, Dr D. J., 8 Gilmore Place,	1895
	Graham, Dr F. M., Willoughbridge, Market-Drayton,	1894
	Graham, Dr J. Gibson, 17 Ashton Ter., Dowanhill, Glasgow,	1888
155	Graham, Dr R. Balfour, Leven, Fife,	1893
	Grant, Dr Lewis, Rock House, Neston, Cheshire,	1896
	Greene, Dr T. W. N., Bella Vista, Kew Gardens, Carlow, Ireland,	1889
	Gregory, Dr W. H., 2 Bar Houses, Beverley, Yorks,	1893
	Guthrie, Dr A. Cowan, 171 Constitution Street, Leith,	1888
160	Hamilton, Dr J. R., Hawick,	1879

		Date of Admission.
	Hamp, Dr J. Walton, Penn Road, Wolverhampton,	1886
	Hardie, Dr Thomas, 10 John's Place, Leith,	1870
	Harvey, Dr Charles E., Kingswood, Sav-la-Mar, Jamaica, W.I.,	1889
	Harvey, Dr James, 7 Blenheim Place,	1891
165	Haultain, Dr F. W. N., 17 Rutland Street,	1884
	Havelock, Dr J. G., Sunnyside, Montrose,	1888
	Hay, Dr Henry, 7 Brandon Street,	1879
	Helm, Dr J. H., Ratho,	1888
	Helm, Dr R. Dundas, 13 Portland Square, Carlisle,	1892
170	Helme, Dr G. Edgar, Gloucester House, Rusholme, Manchester,	1895
	Henderson, Dr Alexander, 21 Pitt Street,	1891
	Henderson, Dr John, 7 John's Place, Leith,	1857
	Herring, Dr Percy T., Physiological Laboratory, University of Edinburgh,	1899
	Hewetson, Dr J., Holmfield, Reigate,	1881
175	Hindmarsh, Dr Edwin, Mozufferpore, Tirhoot State Railway, Bengal, India,	1895
	Hirst, Dr George S. S., Withern, Alford, Lincolnshire,	1894
	Hoggan, Dr R., Bessville, Liberton,	1894
	Holmested, Dr C. W., Tuxford, Newark, Notts,	1900
	Hooper, Dr J. W. D., 70 Collins Street, Melbourne, Australia,	1884
180	Hughes, Dr H. L., Gwernllwyn House, Dowlais, Glamorganshire,	1894
	Hunter, Dr George, 33 Palmerston Place,	1881
	Husband, Dr William, 4 Royal Circus,	1857
	Hutcheson, Dr J., 44 Moray Place,	1888
	Inch, Dr Robert, Gorebridge,	1887
185	Jamieson, Dr Hugh, 13 Rutland Street,	1889
	Jamieson, Dr James, 43 George Square,	1866
	Jardine, Dr Robert, 5 Clifton Place, Glasgow, W.,	1897
	Johnston, Dr R. J., 1 Buccleuch Place,	1899
	Johnston, Dr William, Pitt Terrace, Stirling,	1871
190	Keiller, Prof. Wm., 1523 Thirty-first Street, Galveston, Texas, U.S.A.,	1890
	Ker, Dr C. B., City Fever Hospital,	1894
	Kerr, Dr J. M. Munro, 28 Berkeley Terrace, Glasgow,	1894
	King, Dr J. K., The Glen Springs Sanitorium, Watkins, New York, U.S.A.,	1884
	Kirk, Dr Robert, Bathgate,	1887
195	Krüger, Dr C. H., Main St., Wynberg, Cape Colony, S. Africa,	1899
	Kynoch, Professor Campbell, 8 Airlie Place, Dundee,	1892
	Lackie, Dr James, 1 Randolph Crescent,	1889
	Laing, Dr J. H. A., 11 Melville Street,	1891
	Langwell, Dr H. G., 5 Hermitage Place, Leith,	1891
200	Lee, Dr Herbert E., Gunnedah, N.S.W., Australia,	1892
	Leigh, Dr J. Dickinson, 7 Avenue Road, Falsgrave, Scarboro',	1886
	Leith, Dr Robert M., Provincial Hospital, Port Elizabeth, Cape Colony, South Africa,	1896
	Liddell, Dr J., North View, Victoria Avenue, Harrogate,	1893
	Linton, Dr John, 60 George Square,	1863
205	Linton, Dr Simon, Grangemouth,	1887
	Littlejohn, Dr Harvey, 1 Atholl Crescent,	1890
	Livingston, Dr G. R., 35 George Street, Dumfries,	1898
	Lockhart, Dr F. A. L., 23 Mackay Street, Montreal, Canada,	1890
	Lucas, Dr Robert, Dalkeith,	1871
210	Lyle, Dr F. W., 97 Gordon Road, Ealing, London, W.,	1890
	M'Brearty, Dr James W., Greymouth, West Coast, New Zealand,	1899
	M'Call, Dr John, 9 Windsor Street,	1886
	M'Callum, Dr H., Kinloch-Rannoch,	1887
	M'Cann, Dr F. J., 5 Curzon Street, Mayfair, London, W.,	1896
215	Macdonald, Dr Alexander, 11 Ardmillan Terrace,	1898
	Macdonald, Dr Angus, 31 Rutland Square,	1897

		Date of Admission.
	Macdonald, Dr D. G. Gordon, 26 King Street, Aberdeen,	1896
	Macdonald, Dr W. B., 2 Bayswell, Dunbar,	1887
	Macdonald, Dr W. Fraser, 16 Buckingham Ter., Glasgow, W.,	1884
220	MacGregor, Dr A. V., Durham House, Victoria Road, Hartlepool,	1895
	Macgregor, Dr Donald, Springmount, Jedburgh,	1900
	Macgregor, Dr G. S., 2 Burnbank Terrace, Glasgow,	1888
	Mackay, Dr George, 74 Bruntsfield Place,	1879
	Mackay, Dr W. B., 23 Castlegate, Berwick-on-Tweed,	1899
225	Mackenzie, Dr R., Napier Villa, 2 Morningside Road,	1887
	M'Kerron, Dr R. Gordon, 1 Albyn Place, Aberdeen,	1896
	Mackin, Dr Patrick, 102 Cuba St., Wellington, New Zealand,	1895
	Mackness, Dr G. O. C., Fort Street House, Broughty-Ferry,	1887
	M'Lean, Dr Archibald, Crosshouse, Kilmarnock,	1890
230	Macmillan, Dr John, 48 George Square,	1897
	M'Murtry, Dr L. S., 231 West Chesnut Street, Louisville, Kentucky, U.S.A.,	1889
	MacRae, Dr John, Lynwood, Murrayfield,	1893
	MacVie, Dr S., Chirnside,	1881
	M'Watt, Dr John, Duns,	1879
235	Macwatt, Dr R. C., 7th Bengal Cavalry, care of Messrs King, King & Co., Bombay,	1885
	Maddox, Dr Ralph H., I.M.S., Chapora, Saran, Bengal,	1887
	Mair, Dr Robert, Oliver Crescent, Hawick,	1897
	Malcolmson, Dr Harold, Marine Parade, Holywood, Co. Down.,	1898
	Marshall, Dr G. Balfour, 19 Sandyford Place, Glasgow,	1891
240	Marshall, Dr William, Milnathort,	1884
	Martin, Dr Charles, Dagenham House, Newton Abbot, South Devon,	1892
	Martin, Dr J. W., Burnfoot, Cluden, Dumfries,	1887
	Martine, Dr W. R., Weston, Haddington,	1896
	Matheson, Dr A. A., 41 George Square,	1887
245	Matheson, Dr Roderick M., 2 Kingswood Grove, Douglas, Isle of Man,	1897
	Matthew, Dr Alexander, Corstorphine,	1885
	Maurange, Dr Gabriel, 6 Rue de Tournon, Paris,	1898
	Menzies, Dr David, 20 Rutland Square,	1877
	Messer, Dr Fordyce, Helensburgh,	1866
250	Michael, Dr Gustave, 5 Cambridge Place, Chestergate, Regent's Park, London, N.W.,	1885
	Millard, Dr W. W., 3 George Place,	1884
	Miller, Dr W. H., 51 Northumberland Street,	1886
	Milligan, Dr D., 11 Palmerston Place,	1893
	Milne, Dr W. M., 14 Newington Road,	1898
255	Mitchell, Dr G. B., 40 Baxtergate, Whitby,	1893
	Montgomery, Dr John, The Highlands, Balsall Heath, Birmingham,	1895
	Moorhouse, Dr J. Ernest, 1 Glebe Avenue, Stirling,	1892
	More, Dr James, Rothwell, Kettering, Northampton,	1880
	Morison, Dr Albert E., Wellington Road, West Hartlepool,	1888
260	Morris, Dr S. Glanville, Plâs Cwmtwrch, Nantgaredig, South Wales,	1894
	Moses, Dr O. St John, 159 East Dulwich Grove, London, S.E.,	1900
	Mowat, Dr John, 6 Buccleuch Place,	1884
	Munro, Dr A. Watson, 183 Liverpool Street, Sydney, Australia,	1892
	Murray, Dr A. Lang, 32 Duddingston Park, Portobello,	1889
265	Murray, Dr D. R., 41 Albany Street, Leith,	1878
	Murray, Dr James, 1 Brandon Street,	1879
	Murray, Dr R. Milne, 11 Chester Street,	1880
	Nairne, Dr J. Stuart, 141 Hill Street, Garnethill, Glasgow,	1889
	Napier, Dr A. D. Leith, North Terrace, East, Adelaide, South Australia,	1878

		Date of Admission.
270	Nicholson, Dr H. O., 20 Manor Place,	1900
	Nisbet, Dr W. B., Townsville, N. Queensland, Australia,	1886
	Oakes, Dr Arthur, Narrabri, Cole-park Road, Twickenham,	1879
	Ogilvy, Dr Stewart Grant, 12 Graham Street,	1895
	O'Gorman, Dr Patrick W., 17th Bengal Infantry, Benares, N.-W. Provinces, India,	1899
275	Oliphant, Dr E. H. Lawrence, 23 Newton Place, Glasgow,	1885
	O'Reilly, Dr T. H., care of Dr M'Kellar, Manukan Road, Parnell, Auckland, New Zealand,	1899
	Orr, Dr John, Heather Lea, Clarendon Road, Eccles, Lancash.,	1887
	Orr, Dr W. Basil, 13 Braid Road,	1889
	Paterson, Dr G. Keppie, 19 Albany Street,	1882
280	Paterson, Dr G. W. Simla, 147 Bruntsfield Place,	1896
	Peddie, Dr H. Anderson, 24 Palmerston Place,	1882
	Pereira, Dr A. A. Jervis, Surgeon to the Delagoa Bay Railway, Lourenço Marques, Delagoa Bay, South Africa,	1888
	Perigal, Dr A., New Barnet, Herts,	1887
	Pirie, Dr John, 15 Ardmillan Terrace,	1888
285	Playfair, Dr John, 5 Melville Crescent,	1873
	Poole, Dr T. D., Aberdeen Cottage, Poulton-le-Fylde,	1890
	Porritt, Dr E. E., Greytown, Wairarnpa, New Zealand,	1897
	Porteous, Dr J. Lindsay, 83 Warburton Avenue, Yonkers, New York,	1875
	Potts, Dr W. A., 160 Hagley Road, Edgbaston, Birmingham,	1897
290	Price, Dr A. W. Gordon, 9 Grange Road,	1890
	Price, Dr E. F. T., 1 Middleby Street,	1890
	Primrose, Dr Alex., 100 College Street, Toronto, Canada,	1887
	Pringle, Dr J. Hogarth, 172 Bath Street, Glasgow,	1886
	Proudfoot, Dr Thomas, 30 Lauriston Place,	1884
295	Rattray, Dr A. M. T., Portobello,	1869
	Reid, Dr W. L., 7 Royal Crescent, Glasgow, W.,	1880
	Reid, Dr W. Spence, Oakley, Kirkcudbright,	1880
	Rendell, Dr Herbert R., P.O. Box 606, St John's, Newfoundland,	1882
	Rhodes, Dr J. H., The University, Birmingham,	1898
300	Richardson, Dr William, 66 Cotham Road, Bristol,	1888
	Ritchie, Dr A. Brown, 117 Boston Street, Hulme, Manchester,	1892
	Ritchie, Dr James, 22 Charlotte Square,	1880
	Ritchie, Dr R. Peel, 1 Melville Crescent,	1861
	Ritchie, Dr W. T., 10 India Street,	1899
305	Roberton, Dr Ernest, Auckland, New Zealand,	1887
	Roberts, Dr Ernest T., 75 Skipton Road, Keighley,	1890
	Roberts, Dr R. W., Cattybrook Villa, Cwmavon, near Port Talbot, South Wales,	1894
	Robertson, Dr John A., Matjesfontein, Cape Colony, South Africa,	1892
	Robertson, Dr Robert, 26 Royal Circus,	1897
310	Robertson, Dr W. B., St Anne's, Thurlow Park Road, West Dulwich, London, S.E.,	1870
	Robertson, Dr W. G. Aitchison, 26 Minto Street,	1889
	Robins, Dr H., Sav-la-Mar, Jamaica, W.I.,	1893
	Robinson, Dr H. Shapter, Talfourd House, 78 Peckham Road, Camberwell, London, S.E.,	1890
	Robson, Dr B. S., 66 Brighton Grove, Newcastle-on-Tyne,	1887
315	Ronaldson, Dr T. R., 8 Charlotte Square,	1877
	Rosa, Dr Albert F., 28 Pitt Street,	1893
	Russell, Dr W., 3 Walker Street,	1890
	Sandstein, Dr Alfred C., Pathology Laboratory, Edinburgh University,	1898
	Sapara, Dr Oguntola, Broad Street, Lagos, W. C. Africa,	1895
320	Saunders, Dr F. A., Grahamstown, Cape Colony, South Africa,	1885
	Schofield, Dr L. J., Warrensburg, Mo., U.S.A.,	1893

		Date of Admission.
	Scott, Dr T. R., Musselburgh,	1880
	Shaw, Dr W. J., Cockburnspath,	1892
	Shearer, Dr Alfred, Sunnybank, Stronsay, Orkney,	1898
325	Simpson, Dr W. Petrie, The Elms, Coningsby,	1892
	Simson, Dr Harry, 13 Grosvenor Street,	1897
	Slight, Dr J. D., 2 Durham Road, Portobello,	1898
	Sloan, Dr Allen T., 22 Forth Street,	1893
	Sloan, Dr S., 5 Somerset Pl., Sauchiehall St. West, Glasgow,	1887
330	Smart, Dr David, 74 Hartington Road, Sefton Park, Liverpool,	1882
	Smith, Dr G. H. Walton, Pendower, Oxford St., Paddington, Sydney, Australia,	1892
	Smith, Dr Gains T., Moncton, New Brunswick, Canada,	1891
	Smith, Dr James, 4 Brunton Place,	1891
	Smith, Dr John, Brycehall, Kirkcaldy,	1885
335	Smith, Dr J. Gordon, Akuse, Accra, Gold Coast, West Africa,	1892
	Smith, Dr William, 14 Hartington Gardens,	1890
	Smith, Dr W. Ramsay, Central Board of Health, Adelaide, South Australia,	1892
	Sneddon, Dr William, 58 Bonnygate, Cupar-Fife,	1888
	Somerville, Dr Robert, Galashiels,	1881
340	Spalding, Dr William, Gorebridge,	1867
	Spence, Dr R., St Ninians, Burntisland,	1878
	Spence, Dr William, Dollar,	1884
	Stephen, Dr W. A., Loftus-in-Cleveland, Yorkshire,	1894
	Stephenson, Dr W. H., Apsley Place, Harpurhey, Manchester,	1895
345	Stevens, Dr John, 2 Shandon Street,	1894
	Stewart, Dr J. S., 15 Merchiston Place,	1884
	Stewart, Dr R., 42 George Square,	1885
	Stirling, Dr R., 4 Atholl Place, Perth,	1892
	Stirling, Dr Stewart, 4 Coates Crescent,	1866
350	Story, Dr B. S., 6 Annfield Terrace, Annfield Plain,	1898
	Sturrock, Dr J. F., Arima, Broughty-Ferry,	1887
	Sym, Dr A. C., 144 Morningside Road,	1885
	Taylor, Dr David R., St Helen's, Ayton,	1896
	Taylor, Dr William, 12 Melville Street,	1868
355	Taylor, Dr W. Macrae, 12 Melville Street,	1895
	Teacher, Dr C., 8 Nile Grove,	1887
	Temple, Dr G. H., Ailanthus, Weston-super-Mare,	1888
	Thatcher, Dr C. H., 8 Melville Crescent,	1877
	Thin, Dr Robert, 38 Albany Street,	1891
360	Thom, Dr Alexander, Viewfield, Crieff,	1884
	Thomas, Dr G. W., Hoxton House, Hoxton, London, N.,	1899
	Thompson, Dr James L., Castlemaine, Victoria, Australia,	1894
	Thomson, Dr A. D. R., Musselburgh,	1877
	Thomson, Dr James, David Place, Jersey,	1881
365	Thomson, Dr John, 14 Coates Crescent,	1887
	Thomson, Dr J. Stitt, The Mount, Lincoln,	1877
	Thyne, Dr T. J., 2 Dean Terrace,	1887
	Tod, Dr John, 93 Ferry Road, Leith,	1892
	Tristan, Dr R. J., 28 Carolgate, Retford, Notts,	1887
370	Underhill, Dr C. E., 8 Coates Crescent,	1872
	Underhill, Dr Frederick T., 1373 Barclay Street, Vancouver, British Columbia,	1885
	Underhill, Dr T. Edgar, Dunedin, Barnt Green, Worcestershire,	1879
	Vassie, Dr Alexander H., 98 Priory Road, West Hampstead, London, N.W.,	1891
	Vickery, Dr W. H., 52 Elswick Road, Newcastle-on-Tyne,	1892
375	Wade, Dr George, Melrose,	1893
	Walker, Dr A. Wallace, 24 Forth Street,	1886
	Wallace, Dr Abraham, 39 Harley Street, London, W.	1879
	Watson, Dr Douglas C., 22 Coates Crescent,	1897
	Watson, Dr P. H., 72 Jesmond Road, Newcastle-on-Tyne,	1887

		Date of Admission.
380	Watson, Dr R. H., The Glebe, Hamilton,	1896
	Waugh, Dr John, 36 Finsbury Pavement, London, E.C.,	1881
	Webster, Dr A. D., Belleville Lodge, S. Blacket Place,	1881
	Webster, Dr J. C., Rush Medical College, Chicago, U.S.A.,	1889
	Welby, Dr Frederick E., Colonial Surgeon, St Helena,	1889
385	Whyte, Dr J. Curtis, Dalkeith,	1896
	Wilcockson, Dr G. Morton, 183 Southampton Street, Reading,	1893
	Wilkie, Dr James, Selville House, Portobello,	1897
	Wilkinson, Dr George, 109 Park Road, Liverpool,	1889
	Wilson, Dr James, 53 Inverleith Row,	1889
390	Wilson, Dr T. D., 10 Newington Road,	1879
	Wise, Dr Robert, 5 Weston Park, Crouch End, London, N.,	1890
	Wood, Dr Russell, 9 Darnaway Street,	1880
	Wood, Dr Thomas, 67 Ferry Road,	1886
	Wood, Dr William, 19 Roxburgh Street,	1892
395	Woodside, Dr J. T., Holywood, Co. Down,	1898
	Wright, Dr W. F., Bonnington Mount, Bonnington Terrace,	1887
	Yoe, Dr Richard T., 2103 Floyd Street, Louisville, Kentucky, U.S.A.,	1891
	Young, Dr Peter, 43 Heriot Row,	1859
	Young, Dr Peter A., 25 Manor Place,	1871
400	Young, Dr R. J. Erskine, 8 Alva Street,	1892

CONTENTS.

I.—COMMUNICATIONS RELATING TO OBSTETRICS.

PAGE

Valedictory Address. By J. Halliday Croom, M.D., F.R.C.S.E., F.R.C.P.E., ... 2

Pyosalpinx removed by Laparotomy in the Early Puerperium. By R. Milne Murray, M.A., M.B., F.R.C.P.E., F.R.S.E., . . 38

Notes on a Case of Sudden Death following Labour, due to Cardiac Disease and Pneumonia. By G. W. Simla Paterson, M.B., C.M., 46

Albuminuria, Multiple Pregnancy, Papyraceous Fœtus, and Placenta Prævia. By James Ritchie, M.D., M.R.C.S. Eng., . . 53

On the Cause of the Differentiation of Connective Tissue in the Human Fœtus: with special reference to the essential nature of the Hydatid Mole. By D. Berry Hart, M.D., F.R.C.P.E., . 60

A Case of Puerperal Eclampsia, having a peculiar Puerperal History: and Observations on Coma and its Treatment by Venesection. By S. Macvie, M.B., C.M., ... 71

Delivery by Basilysis. By A. R. Simpson, M.D., F.R.C.P.E., Professor of Midwifery in the University of Edinburgh, . . . 83

The Chronology of Ante-Natal Life. By J. W. Ballantyne, M.D., F.R.C.P.E., F.R.S.E., ... 94

Notes of Five Cases of Eclampsia treated by Saline Infusion. By Robert Jardine, M.D., M.R.C.S. Eng., F.F.P. and S.G., . 108

On the Nomenclature of Transverse Presentation and of Version, with remarks on the choice of the Leg seized. By D. Berry Hart, M.D., F.R.C.P.E., ... 146

On the Set of the Pelvis in the Body (variations in the inclination of the brim apart from posture), and its obstetrical significance. By A. H. Freeland Barbour, M.D., F.R.C.P.E., . . 153

A Case of Cæsarean Section followed by Sub-peritoneal Hysterectomy. By N. T. Brewis, M.B., F.R.C.S.E., ... 186

Clinical Note of a Case of Eclampsia at the Sixth Month of Pregnancy, treated by Saline Infusion and Veratrum Viride. By J. W. Ballantyne, M.D., F.R.C.P.E., ... 196

II.—COMMUNICATIONS RELATING TO GYNÆCOLOGY.

PAGE

Valedictory Address. By J. Halliday Croom, M.D., F.R.C.S.E., F.R.C.P.E., ... 2

Note of a large solid Intra-ligamentary Tumour removed by Abdominal Section. By N. T. Brewis, M.B., F.R.C.S.E., . . . 14

Vaginal Cœliotomy. By J. A. C. Kynoch, M.B., F.R.C.P.E., Professor of Midwifery, St Andrews University, ... 21

Chylous Ascites, with an Illustrative Case. By J. Halliday Croom, M.D., F.R.C.S.E., F.R.S.E., ... 99

Complicated Case of Double Ovariotomy in a Girl aged eighteen. By J. Halliday Croom, M.D., F.R.C.S.E., F.R.C.P.E., . . 104

Pathological Amenorrhœa from other than Constitutional Causes, with Illustrative Cases. By F. W. N. Haultain, M.D., F.R.C.P.E., . 113

Vaporisation (Atmokausis) of the Endometrium. By Professor A. R. Simpson, ... 131

Clinical Note on a Case of Vulvar Hæmatoma. By J. W. Ballantyne, M.D., F.R.C.P.E., F.R.S.E., ... 137

Suppression of Urine following Cystitis. By J. Lamond Lackie, M.D., F.R.C.P.E., ... 181

On Cleansing the Peritoneum during Cœliotomy. By N. T. Brewis, M.B., F.R.C.S.E., ... 190

Kraurosis Vulvæ. By Professor J. A. C. Kynoch, . . . 202

Discussion on the Treatment of Dysmenorrhœa. Opened by F. W. N. Haultain, M.D., F.R.C.P.E., ... 206

III.—MISCELLANEOUS.

Note on Levurine. By Professor A. R. Simpson, . . . 91

TRANSACTIONS

OF THE

EDINBURGH OBSTETRICAL SOCIETY,

FOR SESSION LXI., 1899–1900.

MEETING I.—NOVEMBER 8, 1899.

Dr J. HALLIDAY CROOM, *President, in the Chair.*

ERRATA.

Page 5, line 6, *for* "Dr Parven" *read* "Parvin."
,, 206, ,, 4, ,, "Prof. Sängu" *read* "Sänger."
,, 237, ,, 40, ,, ,, ,,

Carriage of Parcels, etc.,			0	1	1	
Oliver & Boyd's Account for Vol. XXIV. of Society's Transactions (500 copies),			57	4	0	
Oliver & Boyd's Account for Printing Billets, Postages, etc.,			15	16	1	
Rent of Rooms at 5 St Andrew Square,			4	10	0	
Waterston & Sons' Account,			4	0	6	
The Secretaries and Editor for Postages,			0	10	7	
						£85 19 9
Balance to New Account,[1]						448 11 0
						£534 10 9

[1] Of this Balance the sum of £250, 10s. 6d. is invested in 2¾ per cent. Consols.

The Accounts were audited by Drs Church and Cattanach and found correct.

The Treasurer threw out the suggestion that, in view of the large balance in the hands of the Society, something might be done towards defraying the cost of illustrating the papers in the Transactions by the Society itself.

Dr Berry Hart proposed, and *Dr J. W. Ballantyne* seconded, a hearty vote of thanks to the Treasurer, which was unanimously agreed to.

The Treasurer intimated a letter of resignation from Dr Oswald H. Isard.

II. The Society then proceeded to the election of office-bearers for the present session, and the President announced the result as follows:—*President*, Dr Milne Murray; *Vice-Presidents* (*Senior*), Dr J. W. Ballantyne, (*Junior*), Dr M'Vie (Chirnside); *Treasurer*, Dr William Craig; *Secretaries*, Drs Haig Ferguson and W. Fordyce; *Librarian*, Dr Haultain; *Editor of Transactions*, Dr N. T. Brewis; *Members of Council*, Professor Kynoch (Dundee), Dr MacKenzie (Broughty Ferry), Drs Halliday Croom, Berry Hart, Barbour, Ritchie, Darling, and Armour.

III. The following gentlemen were elected Ordinary Fellows of the Society:—John D. Cameron, M.D., 2068 St Catherine Street, Montreal; George Crendson Thomas, M.B., C.M., Swainswick, Bath.

IV. VALEDICTORY ADDRESS.

By J. Halliday Croom, M.D.

My first duty in returning to your hands the trust which you so generously placed in mine two years ago, is to express my profound thanks for the honour you then did me, and for the special mark of kindness and consideration which you showed me during my tenure of office.

My term of office has not been marked by any special features, except, alas! by one, that during the last two years the death-roll has been heavier than during any other similar

period of the Society's history. Death has spared neither those who had long sought retirement, nor those engaged in the busy round of everyday life. No less than twenty-four Members—Honorary, Corresponding, and Ordinary—have been called away during the last two years. It would be impossible for me to refer in detail to each of the Fellows whom death has claimed, but it would be altogether wrong if I were to pass on without some little notice of the Honorary Fellows.

By the death of Dr John Moir has been removed the oldest Fellow of this Society, one who alike by his professional life and private capacity was an ornament to the profession. It is remarkable to think that he occupied the Chair of Obstetrics before the late Sir James Simpson, and that he was still able to read a paper at this Society during my own Presidency, —an original paper upon the Induction of Premature Labour. I think it must be unique in the history of any Society to find a gentleman having attained the ripe age of 93 years writing an original paper at that time of life, and drawing upon his own personal experiences as far back as the year 1827.

Dr Moir's life was an active one in every sphere. He was profoundly interested in this Society, and all that concerned the department of Obstetrics and Gynæcology. He was much interested in all social questions, and was a public-spirited man, taking part in everything for the improvement of the city in which he dwelt. He was deeply interested in the Church to which he belonged, and ever took an active and prominent part in it.

Although Mr Lawson Tait was known to be in very indifferent health, his sudden death came as a shock and surprise to all of us here who knew him so well. Though his name was made in Birmingham, and most of his work done there, Edinburgh can claim his birth and education. None of us can forget the short rotund figure, the massive head, the firm mouth, and thoughtful eyes. A man of universal interests and cosmopolitan reputation, his death robs the profession of a really brilliant surgeon.

He was a man of wide culture, and a mine of information on all subjects. A politician, a preacher, a curio-hunter, and

archæologist—he was a prolific writer on all subjects which were of interest to humanity. His long letter to the *Times* last winter, concerning the present controversy in the Church of England, was amongst his latest contributions to general topics. He shone as a debater. He was blunt and brusque even to the verge of rudeness, and he was masterful and remorselessly tenacious in argument. There was no more interesting personality. In private he was a genial friend, a wonderful raconteur, possessed of an inexhaustible fund of humour.

He began his medical career in Edinburgh. He became House-Surgeon in Wakefield Hospital, and thereafter removed to Birmingham, where all his work was done. There he was one of the founders of the Women's Hospital, a project that encountered much opposition. From start to finish he had a most wonderful career. Professor of Gynæcology in Queen's College, Hastings Gold Medallist, Cullen and Liston Triennial Prizeman, he shed lustre on many honours and appointments freely and ungrudgingly bestowed upon him.

Beyond his great reputation at home, he enjoyed, if possible, a still greater in America. No one could visit him at his house at the Crescent, without meeting endless numbers of practitioners from the States and from the Colonies who had come to study with him.

In gynæcology he was the pioneer in tubal disease. He cleared up the whole question of tubal gestation, so far as surgical procedure is concerned, and his records are most remarkable. He developed the operation and limits of oöphorectomy. For long he told his results to unwilling ears, and although his followers have brought much of his work in the department into well-deserved ridicule, yet the basis of his work remains. He made the operation of oöphorectomy for fibroids his own, and his results have been excellent. It is needless to mention his work on the gall bladder, his long contention about aseptic surgery, his introduction of purgatives instead of opium in the treatment of peritonitis, and his numerous improvements in the technique of abdominal surgery.

His peculiar position with regard to vivisection can only

be accounted for by his great love of animals. All his work, both literary and operative, is too well known to require recapitulation here. His was undoubtedly a great mind, and he has left his mark indelibly impressed on modern gynæcological surgery.

Dr Theophilus Parven was a well-known obstetrician and gynæcologist. His death took place on the 9th of January last year. He was appointed to the Chair of Obstetrics and Gynæcology in the Jefferson Medical College in 1883, which position he continued to hold until his death.

Dr Parven contributed largely to the literature of the subject, and was the author of a well-known treatise entitled *The Science and Art of Obstetrics.* He was likewise the editor of Winckel's work on *Diseases of Women.*

Professor Tarnier was one of the most prominent obstetricians of Paris. He died in his seventieth year. He succeeded Professor Depaul in the Chair of Midwifery and the Diseases of Women and Children in the Paris Medical Faculty in 1884. In 1889 a special Chair of Clinical Obstetrics was founded for him. He developed antiseptics in relation to midwifery, and in what was known as the "Pavilion Tarnier" he reduced the mortality to absolutely nil. In collaboration with Chantreuil and Budin, he produced a great work on Obstetric Medicine, which appeared between 1878 and 1886, and he was the author of prominent works on the Hygiene of Infancy. Perhaps his name is most widely and popularly known with the introduction of the axis-traction forceps, which, every one recognises, are a very great advance. He was the recognised leader of this special department of Medicine in France.

Kranid Feodorovitz Slaviansky was born in St Petersburg in February 1847.

In 1870 he received the degree of M.D., and in 1871—being 24 years of age—the degree of "Privat Docent" in Midwifery and Diseases of Women. After studying abroad for some years he returned home, and in 1876 he was appointed to a professorship in Kazan. This post he held for less than one year, being in 1877 appointed to the Chair of Midwifery and Diseases of Women at the Academy. For six years he held this post, and was then given the Chair of Clinical

Midwifery and Gynæcology. On the expiry of his term of twenty-five years' service in 1893, he was retained by order of the Government for a further period of five years as Professor in Ordinary. This he would have completed on the 9th December 1898.

That is the dry statement of chronological fact, but it hides within it a whole life full of activity and of great energy. While still a student he studied zealously and worked hard at morbid anatomy and pathology, and the results of this labour attracted such attention that he was admitted a member of the Society of Russian Physicians in St Petersburg at the very moment of completing his Academic career. All through his published works on the Physiology of the Ovary, on the Pathology of the Placenta and Membranes, on the Diseases of the External Organs of Generation, and on Gynæcological Therapeutics, one finds very markedly the predominating strain of his early researches in morbid anatomy.

After graduation Slaviansky travelled much abroad and visited many foreign medical schools, including our own, and on his return to St Petersburg was appointed Accoucheur to the city police, and began to lecture privately. Soon, however, he was given charge of a junior clinique, and worked it up with such energy and with such tremendous success that the premises were increased by a large museum and a new laboratory. His intimate knowledge of three languages enabled him to follow closely the progress of his department in other countries, and by judicious investigation of every new proposal he kept himself well to the front in the march of operative gynæcology, adopting what he found to be genuine, and discarding what he deemed useless without even a second thought. Unswerving in his own principles, he acted up to them by never forcing his opinions on his students. He often allowed them to do operations he himself refused to perform. By no means a brilliant orator in the ordinary sense of the word, it was impossible to hear him speak without recognising that every word was the product of a broad and cultivated mind.

His literary productiveness was quite extraordinary. Besides editing numerous translations, he published fifty original works. He was a member of twenty-eight Russian and seven-

teen foreign societies. The amount of work he did as editor of journals and secretary to societies was phenomenal. He was the founder of the Russian Society of Midwifery and Gynæcology.

By the death of Dr Charles West, at the age of eighty-one, the profession lost one of the most memorable physicians of the century. He received his early education at his father's school, and after being an apprentice in medicine to a local practitioner, he proceeded to the University of Bonn, where one finds that at the age of twenty he gained the prize for a Latin essay on "The Female Pelvis and its Influence on Parturition." He took his degree of Doctor in Berlin in 1837. Returning to London, he worked in the medical wards of St Bartholomew's, and as the result of his clinical opportunities there, he published an account of the epidemic of typhus fever (1837-38) in the *Edinburgh Medical and Surgical Journal* for April 1838.

In the same year he published a translation of the younger Nægele's work on *Obstetric Auscultation*, and at the same time turned his attention to what was afterwards the chief work of his life,—the study of the diseases of children at the Infirmary in Waterloo Road. But a few years later, West began to take a special interest in midwifery, and in 1845 he was appointed Lecturer on Obstetrics at the Middlesex Hospital, and in 1846 he became Physician Accoucheur to the same hospital. In 1848 he was appointed Lecturer on Midwifery at St Bartholomew's Hospital, a post which he held for twelve years. His lectures made him famous; delivered in a most graceful style, they were distinguished by sound common-sense, and displayed a power of keen observation. It was during these years that he published his book on *Diseases of Women*. It went through four editions, and in preparing the last he had the co-operation of Dr Matthews Duncan.

West still took a tremendously keen interest in the Diseases of Children, and although he failed to convert the Dispensary in Waterloo Road into a hospital, to him belongs the honour of being ultimately the founder of the Children's Hospital in Great Ormonde Street, which was opened in 1852, and to which for twenty-three years he was the Senior Physician.

Dr West's own account of the institution of this hospital and his connection with it is most interesting reading.

In 1852 West delivered the Croonian Lectures on "Ulceration of the Os Uteri," which, when published, did much to correct the exaggerated importance of the use of the speculum in diagnosis, and the abuse of caustics in the treatment of so-called ulceration.

He was a voluminous writer, and published, besides articles on varied subjects, numerous contributions to our knowledge of obstetrics, gynæcology, and the diseases of children.

Charles West was one of the best public speakers in the profession; he possessed the qualities of an orator, and could always obtain, from even those who differed from him, a patient hearing.

For some years he wintered on the Riviera. While there, in the beginning of 1898, he became very feeble, and longing to be at home, he commenced his journey from Cannes on March 1st, but he only got as far as Paris, where he died on March 19th.

The last two years have been a record of steady work in the Society, but I hope you will bear with me while I occupy a few minutes of your time by trying to impress upon the younger Fellows the advantages to be derived from taking a personal interest in the Society. Our Society has fallen too much into the hands of specialists. This is not as it ought to be, because though gynæcology is a speciality pure and simple, yet obstetrics is not so, and appeals, and must appeal, to every general practitioner of medicine. Although the backbone of every society must always be the scientific papers which are there read—and there are few societies in which more good scientific work has been done than in the present one—yet, at the same time, these purely scientific papers must and can only be of interest to those specially interested in the department. Short clinical papers and clinical evenings and subjects for discussion seem to me to be the subjects which will be most interesting to practitioners generally. The institution of clinical evenings would perhaps be a novelty. We could not, of course, expect to introduce here what has everywhere else proved an unqualified success, namely, the exhibition of living specimens;

but even that is not an impossibility. I do not see, in the least, why a doubtful tumour in the living person should not be seen here and examined and discussed, any more than a similar tumour is exhibited and discussed at the hospital before fifty or twenty students. There is no impropriety in the one any more than in the other, if, indeed, there is any impropriety in either.

Though material for clinical evenings such as I have suggested may not be very plentiful, yet short clinical papers would make an evening very practical and useful. Dr Haultain's suggestion of discussing specimens for any length of time subject to the discretion of the President, was a move in the right direction, and one which I hope will be taken full advantage of. Our Society has not to complain of what many of the London Societies have to complain of, namely, that the papers that are read here are published in the *Transactions* only, perhaps a considerable time after the interest of the paper has ceased. Here we place no embargo on the paper being published anywhere the author likes immediately after it has been read, nor does such previous publication preclude its appearance in the *Transactions*. Furthermore, the selection of subjects for discussion would from time to time give fresh interest to the Society; the subject being announced beforehand would enable the Fellows of the Society to think the matter over and to prepare observations and reminiscences worthy of the occasion. It is not given to every one to grasp the tenor of a long paper rapidly read, nor can the majority of men prepare and deliver on the spur of the moment a clear account of what they know on the particular subject. Nobody realises more than I do how difficult it must be for the Secretaries always to keep the agenda paper filled; and when one remembers the limitations of our branch, and the fact that we meet every month, as often as the Medico-Chirurgical Society, which draws from every branch of medicine, gynæcology included, I think we may congratulate ourselves on the energy of the Society. Still, I venture to believe that the suggestions which I have thrown out might be useful in extending the scope of our Society amongst the practitioners. Our Society possesses a very liberal roll of

Members, yet the attendance at our meetings is by no means numerous, and I venture to attribute this to the fact that the scientific and operative sides of obstetrics and gynæcology can only interest a few, and although such subjects ought to form by far the most predominant feature in the Society, yet I believe the development of the more clinical side would attract a larger number of members.

So far as this Society is concerned, this is the last Valedictory Address, the last time your President will have an opportunity of saying farewell to you this century. Although I have no intention whatever of inflicting upon you a synopsis of the work done and advances made between the dawn and the setting of the century, yet I may be allowed very shortly to make reference to some of the more prominent advances.

No doubt, gentlemen, since the early days of this century there has been magnificent progress in obstetrics, but after all, if you look back to the records, it will be apparent to you that almost every one of the operations performed by obstetricians, nay more, the very instruments themselves, were all foreshadowed ere the century dawned. With the revolving years, of course, there have been mighty improvements, improvements in technique, in operations, and in the instruments themselves, but yet, great though these improvements have been, no very original operations, no absolutely original instruments have been devised, as far as obstetrics is concerned. The forceps have been modified, altered, improved, beyond a doubt. The scope of their use as a life-saving instrument has been enormously increased, but yet the forceps is two centuries old at least. The operation of embryulcia has been improved in various ways, but the operation of embryulcia is as old as the time of Hippocrates. The operation of turning is as old as Ambroise Paré, and the induction of premature labour was a recognised operation before this century began. The operation of symphyseotomy as originally suggested by Lever in Pineau in 1575, or as modified by Ligault and Le Roy in 1768, was an operation which, at that time, was with justice condemned, but as recently produced it has an unquestionable future before it. The American operation of gastro-elytrotomy

is an improvement upon an operation which was introduced by Jorg in the beginning of the century.

Though these operations in a more or less crude form were practised before the century began, yet it is needless to point out to you the great improvements in all those operations. Axis-traction forceps have rendered delivery possible with almost scientific accuracy. A closer acquaintance with the mechanism of labour and an early recognition of pelvic deformities has made it possible for the practitioner now to avoid a sacrificial operation by the induction of premature labour, or the performance of Cæsarean section, and to recognise the necessity for these operations, and to undertake their performance while the patient is yet unexhausted and her tissue uninterfered with, and not to wait, as formerly, until the patient is exhausted by futile attempts to deliver in some other way.

Cæsarean section has made enormous advances. It is now possible to deliver a woman with extreme pelvic deformity by this method, with a mortality of perhaps 10 or 12 per cent.; whereas at the beginning of the century the mortality could not be much less than 90 per cent. This is in a large measure due to the labours of Sanger.

Taking again those cases of less extreme deformity, it is possible now to save the child by means of the operation of symphyseotomy.

The operation of turning—in itself a very old operation—has been simplified and improved, thanks specially to the work of Braxton Hicks, by the introduction of the bipolar method. The adoption of this bipolar method of turning has, no doubt, specially in the cases of placenta prævia, saved hundreds of lives.

Perhaps the greatest of all improvements is not in operative obstetrics, though that is great enough, but rather in prevention. One is struck all round with the enormous advance of preventive medicine generally; the prevention of small-pox, typhoid, diphtheria, and so forth. But preventive medicine has advanced in obstetrics as well. At the beginning of the century puerperal fever was the scourge of our lying-in hospitals. Now the death-rate has been reduced, in properly conducted hospitals,

so far as puerperal septic fever is concerned, to practically nil. It is true that in private practice it seems to go on unabated. Dr Cullingworth has drawn up statistics pointing out this very significant fact.

To what are all these advances due? What has made these advances possible? In the first place, chloroform has made it possible to use the forceps more carefully, and to perform the other operations to which I have had occasion to refer with greater care and skill, and has helped greatly to make Cæsarean section the success it is. And the other potent factor in rendering these operations safe, and in reducing mortality, is the almost universal use of antiseptics in hospitals and in private.

Gynæcology, unlike obstetrics, was born during the century, and although, therefore, but a young branch of science, its development has been rapid and its achievement most brilliant. To chloroform and antiseptics it is as much, if not more, indebted than its sister branch of obstetrics. It may safely be said, without those two abdominal surgery would be an impossibility. Abdominal surgery really began with ovariotomy. Perhaps the origin and development and progress of ovariotomy is the most striking advance in surgery, whether gynæcological or otherwise. Performed first at the beginning of the century by Ephraim M'Dowell, and then by Clay of Manchester, whom we know as the father of ovariotomy in Europe, it never, however, became recognised as an established or legitimate operation until it was taken in hand by Spencer Wells. Others did occasional operations, but it is really to Spencer Wells that ovariotomy owes its first legitimate start. Wells had performed ovariotomy before the introduction of antiseptics, but it was not until 1858 that Spencer Wells published his first remarkable series of cases which established ovariotomy as a justifiable operation.

Perhaps no department of surgery benefited more by the introduction of antiseptics than did abdominal surgery; but ovariotomy had been an established operation for twenty years before antiseptics was known. The magnificent work of Keith and Tait, and of men who are still with us, is too well known to require any allusion from me, and if the century had seen no

other development or improvement but that of ovariotomy, that in itself would have been an event worth recording.

After the introduction of antiseptics, abdominal surgery advanced in all directions; but nevertheless, looking back on the history of ovariotomy, I think we can say with a certain amount of pride that abdominal surgery is mainly due to gynæcology.

The surgery of the liver, the gall-bladder, the kidney, the stomach, the bowels, the appendix, are all directly due to the development of ovariotomy. Antiseptics have undoubtedly removed the great risk of abdominal surgery, and practically made it possible to do anything in the abdominal cavity, provided there was no uncontrollable hæmorrhage, or no absolutely irreparable lesion.

Tait opened up a wide field in dealing with diseased ovaries and tubes, and led the way to a clear pathology of the extra-uterine tissues. One must stop to record the enormous advance there has been made in our knowledge of extra-uterine pregnancy; that of itself is an epoch-making advance. In the early days of this century, our knowledge of that subject was simply chaotic, and now an extra-uterine pregnancy can be diagnosed and dealt with, with not only a reasonable, but an almost certain amount of security. No doubt all these operations upon diseased tubes and extra-uterine pregnancy have been overdone, but there is just as little doubt that our knowledge of those subjects has now become so focussed that the really important cases can be diagnosed and dealt with, and the others to a great extent left severely alone.

It would be unpardonable to omit an allusion to the method of dealing with fibroid tumours by removal of the uterine appendages, and that was an original idea of Tait's, and has been adopted and crowned with lasting success. The advances likewise in dealing with uterine fibroids by complete removal by the various methods, such as hysterectomy either by the vaginal or abdominal route, pan-hysterectomy and its various modifications, have almost opened a new era in gynæcological surgery.

With regard to the minor class of operations, it would be going far beyond the scope of a short address like the present to go into any details about them. Though less important

perhaps, and less striking, they are none the less useful. They are the development of the last three decades of the century.

Gentlemen, I have no desire to detain you longer. In a farewell address like the present, I cannot be expected to go into all the details of the various improvements in technique, but to any one who is interested in gynæcology and who ventures to review it during the last half century, which really marks its birth and development, one cannot fail to be impressed with the fact that a whole department, though so recent in its origination, has been fraught with such enormous benefits to the human race.

In demitting this Chair, and in passing on the Torch from this century to the next, I can only congratulate you most heartily and sincerely on the choice of my successor—Dr Milne Murray. He belongs to a younger race of brilliant gynæcologists who will uphold and advance the branch which he adorns. It is to me a matter of pride to know that he was my pupil, my assistant, and my best of friends, and in asking him in your name to occupy this Chair, I do it with a feeling of pride, and at the same time with an assurance that he will enhance the reputation of the Society of which he is now the President.

On the motion of *Dr Berry Hart*, a cordial vote of thanks was given to Dr Croom for his address and for his conduct in the Chair during his Presidentship.

V. NOTE OF A LARGE SOLID INTRA-LIGAMENTARY TUMOUR REMOVED BY ABDOMINAL SECTION.

By N. T. Brewis, M.B., F.R.C.S. Edin.

Solid neoplasms growing between the layers of the broad ligament may develop from the uterus, the connective tissue of the mesometrium, the Fallopian tube, the round and ovarian ligaments. The new growths met with are fibromata, myomata, fibro-myomata and sarcomata. Tuberculosis and cancer are always secondary. Sarcomata develop from the connective tissue normally present. Berry Hart and Bland Sutton each

report a case. I have met with two cases growing in the cellular tissue of the recto-vaginal septum. Bland Sutton, in his valuable book, *Surgical Diseases of the Ovaries and Fallopian Tubes, including Tubal Pregnancy*, at page 350, says myomata have not been observed before the thirty-fifth year; but Doran disproves this statement in his paper entitled "Cases of Fibroma and Fibro-myoma of the Broad Ligament," published in Vol. XLI. of the *Transactions of the Obstetrical Society of London*. After attaining a certain size, myomata may undergo cystic or sarcomatous degeneration, and grow with great rapidity. Sarcomata in the broad ligament, as elsewhere, may occur at an early age.

Intra-ligamentary solid growths are so rare that I thought the Society would be interested in the following case:—

M. H., æt. 49, an unmarried lady, was sent to me by Dr M'Callum of Wooler. She complained of an abdominal swelling which she first noticed in June 1897 as a hard swelling about the size of an orange presenting in the right iliac region. The swelling increased gradually and slowly till three months ago, from which time it has grown rapidly. The patient has always enjoyed good health, and the tumour has never caused any pain in the abdomen or pelvis, but occasionally a sharp pain has been felt in the back, coming suddenly, and lasting for days. Menstruation has recurred regularly every three weeks, lasting two or three days, the amount, which never was abundant, has been scanty during the last few years. She has always menstruated with comfort. There has never been any inter-menstrual discharge.

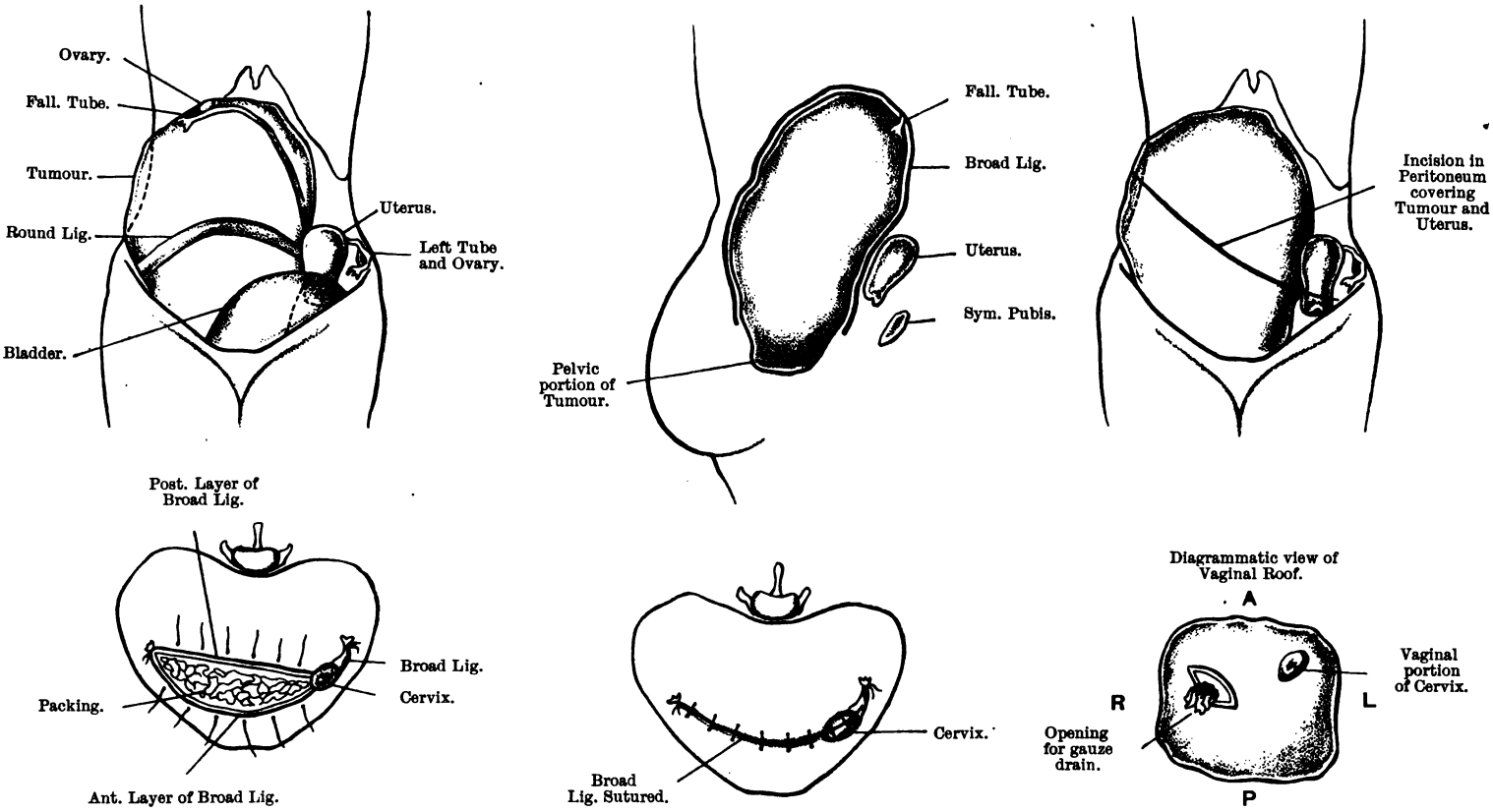
About every three months during the last three years the patient would for three and often four days pass little urine—less than a teacupful in twenty-four hours; this caused her no discomfort. The patient has always been subject to severe bilious attacks, but these have been less frequent of late years. The bowels have always been constipated, but not more so lately. She has not lost flesh.

Physical Examination.—The abdomen is distended to the size of a seven months' pregnancy by a tumour of firm consistence. The swelling is ovoid in shape, and presents a regularly smooth surface, except in the left iliac fossa, where

a hard lobe about the size of an orange is felt. The tumour is not movable. No fluctuation can be made out, and no bruit is heard. Per vaginam the tumour is found to extend low down into the right side of the pelvis, and in this position feels hard and nodular. The uterus is made out to be in the abdomen, pushed upwards and to the left by the tumour, and occupies the position of the lobe before mentioned. The external os uteri is at the level of the pelvic brim. The sound passed into the bladder goes upwards and to the left, and its point is felt about three inches above Poupart's ligament.

As the tumour was growing rapidly there was no hesitation as to treatment.

Operation.—On 25th October 1899, the second day of the menstrual period, the abdomen was opened by a long incision, the tumour turned out, and its relations recognised. It was found to be a solid tumour growing between the layers of the right broad ligament. The Fallopian tube stretched over its summit; the right ovary, compressed flat, lay behind the outer end of the tube; the right round ligament, greatly hypertrophied, coursed across the anterior surface; while the bladder covered the lower part of the tumour and uterus. The latter, somewhat enlarged and containing a small fibroid embedded in its anterior wall, lay in the left iliac region. The left ovary and tube were healthy. The tumour descended deep down into the pelvis. The left ovarian and round ligament vessels were first tied, and the broad ligament divided. An incision was then carried through the peritoneum over the anterior surface of the uterus and tumour. The broad ligament was now peeled off the tumour, and the latter shelled out of its bed after the right ovarian artery had been tied. The uterine arteries were then secured and the body of the uterus removed. There was much oozing in the cavity left by the removal of the tumour. Iodoform gauze was packed into the cavity and brought through an opening made in the vaginal roof. The anterior and posterior layers of the broad ligament were then stitched together over the gauze and stump of the cervix. The abdominal wound was closed without a drainage-tube. The patient stood the operation well, and was put to bed with a pulse of 72 per minute. Her progress since has been



FIGURES ILLUSTRATING THE POSITION OF, AND THE OPERATION FOR, REMOVAL OF INTRA-LIGAMENTARY TUMOUR IN DR BREWIS'S CASE.

[*Face p.* 16.

satisfactory. The temperature remained normal till the fifth day, when it rose to 100°, but came down to 98·4° after the packing had been removed.

Description of the Tumour.—The tumour at the time of removal was pale red in colour and weighed 18 lbs. Its shape is oval; laterally compressed, it measures 13 inches by 10, and its circumference is 27 inches. It is chiefly made up of one large lobe, which is divided at its base by two deep sulci into three smaller lobes. The tumour is covered by a capsule, which is thin over the general surface, but is in places gathered into thick bands which compress the substance of the tumour in the form of furrows. These furrows are well marked on the summit and on the anterior and posterior surfaces. Anteriorly the centre is compressed and branches are sent out laterally. The greater portion of the surface is smooth and even in contour, the summit is more irregular and presents two small bosses. The consistence is firm as a whole, in some portions it feels somewhat hard and nodular, in others doughy. The tumour had no pedicle.

On section the cut surface presents a greyish-white appearance studded over with numerous small bleeding points. The surface of the outer third of the section is even, while that of the inner two-thirds shows numerous pits due to mucoid softening. At one part there are two irregularly shaped cavities filled with myxomatous-looking material. Since removal much blood and watery fluid have oozed out of the tumour.

Microscopical Examination of a portion of the tumour by Dr W. B. Drummond:—

"A section removed from the outer portion of the tumour presented the ordinary appearance of a fibro-myoma in which the fibrous tissue was relatively abundant. The bundles of non-striped muscle presented the usual wavy character and crossed each other in all directions. The entire section was extremely vascular, and connective tissue cells were very abundant round about the blood-vessels, and in parts of the section were collected into small groups. Here and there a tendency to myxomatous degeneration could be made out, but this process was apparently more marked in the central por-

tions of the tumour, from which, however, sections were not made."

REMARKS.—The following points in this case appear to me worthy of notice:—

1. *The absence of symptoms.*—The patient carried this heavy solid tumour without any inconvenience, her general health was in no way affected, and menstruation occasioned no discomfort. The occasional marked diminution of urine, due probably to pressure on the ureters, was the only symptom which could be attributed to the growth.

2. *Diagnosis.*—The position of the tumour and the displacement of the uterus and bladder pointed to the growth being situated between the layers of the right broad ligament. Its consistence excluded ovarian or broad ligament cystomata. The position and consistence of the growth indicated either a solid tumour of the mesometrium, or a fibroid growing from the side of the uterus.

The differential diagnosis between these conditions must always be difficult. Both may cause the same uterine displacement. The length of the uterine cavity is not a certain guide, as the uterus may be greatly enlarged by a fibroid without any corresponding increase in the dimensions of its cavity. In the case I record, no vascular bruit was heard, but this sign is often absent in uterine fibroids. The diagnosis can only be settled after opening the abdomen; even then the origin of the tumour may be doubtful.

3. *Operation.*—The operation was quite a straightforward one. Injury to the ureter was the chief risk. It was feared the ureter might be placed above the tumour, and great care was exercised in peeling off the layers of the broad ligament. After the tumour had been removed, we were pleased to recognise the duct uninjured. There was much oozing from the vessels of the mesometrium. This was effectively controlled by ligature of the ovarian and uterine arteries on both sides, and by packing gauze tightly between the layers. Bringing the gauze into the vagina instead of through the abdominal wound gave better drainage, and enabled us to stitch the anterior and posterior layers of the broad ligament over the gauze so that the drain was entirely extra-peritoneal.

Dr Croom said he had listened to Dr Brewis's paper with great interest, and congratulated him on the care with which his case had been diagnosed and the successful issue to which it had been brought. He believed that one of the main features in diagnosing sessile cysts and intra-ligamentous tumours generally depended to a great extent on finding the uterus tilted up near to or above the symphysis pubis. He believed that although this was not absolutely pathognomonic, yet it was at least nearly so. He was quite of opinion that the secret of dealing with these tumours depended almost entirely, as Dr Brewis had shown, in dealing with the uterine and ovarian arteries before attacking the tumour itself. This, he thought, made the operator master of the situation. Dr Croom expressed the opinion that Dr Brewis had dealt with an exceptionally difficult tumour in a most brilliant manner.

The President (*Dr Milne Murray*) and *Dr Berry Hart* also made remarks.

Dr Brewis replied.

MEETING II.—DECEMBER 13, 1899.

DR MILNE MURRAY, *President, in the Chair.*

I. The following gentlemen were elected Ordinary Fellows of the Society:—John Eason, M.B., C.M., 196 Newhaven Road, Leith; W. J. Barclay, M.B., Ch.B., Royal Infirmary, Edinburgh; F. A. F. Barnardo, M.B., Ch.B., Royal Maternity Hospital, Edinburgh; A. Dingwall Fordyce, M.B., Ch.B., Royal Maternity Hospital, Edinburgh; W. T. Ritchie, M.D., 10 India Street, Edinburgh; and T. H. O'Reilly, L.R.C.P. & S.E. Manukan Road, Parnell, Auckland, N.Z.

II. *The President* showed a DOUBLE UTERUS with a cystic tumour of the ovary, where the patient had died of general tuberculosis. She was a nullipara.

III. *Professor Simpson* showed (1) a LARGE FIBROID TUMOUR

removed by supravaginal hysterectomy; (2) An ANENCEPHALIC FŒTUS born at the seventh month; the kidneys were normal, showed no evidence of activity, and the bladder had apparently never been filled.

IV. *Dr Lackie* showed a HAIRPIN which he had removed from a female bladder. The history was that a young lady, aged 25, woke up one morning last August at 5 A.M. with a sense of severe itching in the region of the vulva. She therefore withdrew from her hair a tortoise-shell hairpin, and with the rounded end endeavoured to relieve her discomfort. Presently, however, the pin slipped from her fingers and disappeared, and to her astonishment she found she could not regain it. Later in the day she informed her mother of the accident, and began to have frequent and painful micturition. The lady's doctor was sent for, and as on examination he could not detect any foreign body in the vagina, he concluded that it had passed into the bladder. The patient being chloroformed, Dr Lackie discovered that the pin had passed into the bladder. The urethra was therefore dilated by means of Hegar's bougies, and the index finger of the left hand introduced until it came into contact with the two sharp points of the pin. An effort was first made to pass a pair of forceps alongside the finger, and to approximate these ends and so withdraw the pin, but this proved impossible. It was therefore determined to turn the foreign body so as to get the rounded end next the urethral canal. This was accomplished only with great difficulty, since, when the pin came to lie transversely, the sharp ends persisted in penetrating the mucous membrane, and remaining fixed. Ultimately, but only after persevering for half-an-hour, he attained his object, and then, on passing in a pair of very finely bladed forceps, the pin was grasped and easily withdrawn. There was considerable hæmorrhage from rupture of the external meatus, and it was feared that, owing to the considerable stretching of the urethral canal, the patient might suffer from incontinence of urine for some time, but fortunately such was not the case, as she never lost control of the function of micturition, and twenty-four hours later was perfectly well.

V. *Dr Haig Ferguson* showed an UNUSUALLY LARGE CYST OF DUVERNEY'S GLAND. The patient consulted Dr Ferguson two years ago, when a translucent swelling, the size of a duck's egg, was found occupying the left labium majus. As the swelling caused little or no inconvenience, the patient refused interference at that time, and Dr Ferguson heard nothing more of her till about three weeks ago. He then received a letter from her husband to say that the swelling had increased to such a size as to cause considerable inconvenience and pain, and wishing to arrange for its removal. She was to come into a private home for operation on the following day, when a note was sent saying the swelling had burst through the night, and that now no treatment would be necessary. When it was explained, however, that further trouble would likely arise unless she came in for treatment, she placed herself under Dr Ferguson's care. The patient states that the swelling had increased to the size of a goose egg, and her husband says that about a teacupful of fluid escaped when it burst. It was found that the cyst had ruptured superiorly close to the clitoris, and that a continuous oozing of clear fluid was taking place through the aperture. The collapsed cyst was dissected out completely. There was considerable hæmorrhage from the cavity after the removal of the cyst, but this was easily controlled. The cyst extended up alongside the vaginal and rectal walls, and the cavity left after its removal was stitched up with catgut, and drained. The wound healed quickly and without incident. The size of this cyst is worthy of remark, as it is extremely rare for such cysts to grow to such a size.

VI. VAGINAL CŒLIOTOMY

By J. A. C. KYNOCH, M.B., F.R.C.P.Ed., Professor of Midwifery, St Andrews University; Obstetric Physician and Gynæcologist, Dundee Royal Infirmary.

WITH the abandonment of Freund's abdominal operation, and its substitution by vaginal extirpation of the uterus, we had demonstrated for the first time the facility of entrance into the peritoneal cavity through the anterior or posterior vaginal fornix.

The abdominal operation introduced in 1878 was followed

by such a high rate of mortality that the more favourable results obtained by the vaginal operation, with its improved technique, led to the latter being almost universally adopted.

Lately, the pendulum has swung in favour of the abdominal route in the treatment of cancer of the cervix, but the results do not yet warrant our substituting it for the vaginal operation.

As far back as 1857, Atlee opened and evacuated a collection of purulent fluid, with subsequent separation of adhesions, through the posterior fornix.

The case was not published in detail, but from the short description given of it by Goodall, it would appear to have been a case of suppurating ovary or cyst, with removal of the sac in detached pieces. In 1870 Thomas performed and described the technique of vaginal ovariotomy, and we have at the same time the report of a case of suppurating cyst similarly treated by Goodall, a dermoid cyst the size of an orange by Battey, and simple cysts removed by Davis, Gilmore, and Wing, making in all a record of six vaginal ovariotomies about this period.

Goodall in his paper states that the indications for the operation must be limited, and that it cannot replace abdominal section, although the latter may follow the vaginal operation when it cannot be completed, and he points out the advantage of good drainage obtained through the vaginal incision.

About this time such startling records of success by abdominal section were forthcoming, that the vaginal operation fell into oblivion to such an extent that Hegar and Kaltenbach, in the edition of their book on *Operative Gynæcology*, published in 1881, state that the vaginal operation need only be considered of use in those rare cases where a small ovarian tumour was found associated with vaginal prolapse.

With Müller's proposal in 1882, of splitting the uterus vertically to facilitate its removal, and that of Fritsch in 1886, of opening the vesico-uterine pouch as an early step in extirpation of the uterus, we see indications of advancement in technique favouring the adoption of the vaginal route. In 1887 Gusserow treated pelvic hæmatocele by vaginal incision. About the same time Doyen pointed out the importance of the vesico-

uterine space in pelvic surgery, when he published a record of 100 cases of pelvic disease so treated.

Sänger, when discussing the treatment of retroflexion of the uterus in 1888, suggested, but did not at first carry out, vaginal fixation, by making an incision through the anterior fornix, and fixing the fundus to the vaginal wound. In 1892 MacEnrodt carried out Sänger's suggestion of vaginal fixation by first fixing the fundus to the vaginal wound without opening the peritoneum, but, finding the results unsatisfactory, he subsequently opened the pouch, and fixed the fundus to that part of the peritoneum covering the bladder. In 1893 Duhrssen proposed the name "Vaginal Laparotomy" for an operation he had performed for retroflexion in 1890, and from 1893 onwards, systematically, and with increased frequency, reporting 182 cases so treated, and extending the indications for anterior colpotomy to removal of myoma from the uterine wall and diseased appendages. About the same time Martin wrote in favour of the operation. The publication of the English translation of Duhrssen's book made his operations and methods known in this country, so that the limitations and indications for the vaginal route have already been frequently discussed.

It is with the hope of eliciting the opinion of the Fellows of this Society on this subject that I venture to bring it forward to-night.

I shall not take into consideration, at present, cases of vaginal hysterectomy for uterine disease or pelvic suppuration.

Technique.

It will be unnecessary for me to describe in detail the steps of an operation which essentially consists in those adopted in the first part of vaginal hysterectomy. The importance of taking the same precautions in preparing the patient for vaginal as for abdominal section will be shown when referring to some cases, and also the necessity of rendering the uterus as aseptic as possible by preliminary curetting when there is any fœtid uterine discharge. As with abdominal section, the operation of vaginal cœliotomy may be considered as having three steps:—(1) Opening into abdomen; (2) Removal or examination of

diseased organs; (3) Closure of the vaginal wound, completely or partially, to permit of drainage.

The opening into the abdomen may be carried out through the anterior fornix (advocated by Duhrssen), posterior fornix (MacEnrodt), or by adopting either route, according to the position in the pelvis of the part to be operated on, as recommended by Wertheim. Personally I prefer the posterior incision.

In anterior colpotomy the incision may be transverse or longitudinal, the latter being more favourable for the safety of the ureter. On pushing through the cellular tissue with the finger between the uterus and bladder (easy in multiparous, but frequently requiring the aid of scissors in nulliparous patients) the peritoneum is exposed and divided. I puncture the peritoneum with long sinus forceps, and open the wound to the desired extent. The fundus uteri and its appendages may be brought through the opening, examined by inspection, and if any of the parts have to be removed, the broad ligament may be ligatured and divided. Traction on the fundus through the posterior fornix is to be avoided on account of the risk of injuring the bladder.

Drainage, if deemed necessary, is best carried out through the posterior incision. If not, the wound may be completely closed. In my own practice I introduce an iodoform gauze drain, which is removed in twenty-four hours, and I leave the wound to close without sutures.

The after-treatment is the same as for vaginal hysterectomy.

Indications.

1. *Retroflexion of the Uterus.* — Although attempts had previously been made to retain the uterus anteverted by vaginal fixation in cases not amenable to pessary treatment, it was only with the elaboration of the operation as suggested by MacEnrodt and Duhrssen that this operation for retroflexion came to have more than a limited trial.

Few will probably admit of the necessity for the frequency with which those Berlin gynæcologists resort to this plan of treatment in uterine displacement. In support of his claim Duhrssen quotes a collection of cases by Neugebaur where

harmful results were produced by neglected pessary treatment. Of those cases Neugebaur states that eight died from sepsis and peritonitis as the direct effect of the pessary, and eight developed cancer (supposed to have some connection with the long-continued irritation of the pessary).

He further reports 23 cases of perforation into bowel.

20 „ „ „ bladder.
10 „ both viscera perforated.
2 „ uretero-vaginal fistula.
4 „ perforation into pouch of Douglas.
6 „ perforation of uterus.

Against these unfavourable results as the consequence of neglected pessary treatment, must be reckoned the constantly increasing number of reported cases where operative interference (including Cæsarean section) has been found necessary in cases of labour following on vaginal fixation.

I have myself treated two cases of mobile retroflexion of the uterus by Duhrssen method of vaginal fixation where the leading symptoms (pain and dysmenorrhœa) had not been relieved by prolonged pessary and general treatment. Both patients improved, the uterus remains in its normal position, but as pregnancy has not occurred in either case, the most important question of its effect in labour in estimating the value of this plan of treatment cannot be judged of by those cases.

2. *Inversion of the Uterus.*—In cases of inversion, where reduction by ordinary means fails, and before resorting to the more radical treatment of amputation of the uterus, Kustner first suggested the introduction of the finger through a posterior vaginal incision to dilate the constricting ring.

He has reported several cases where this method, alone or combined with an incision through the posterior uterine wall, succeeded. More recently still, Kehrer reports a case successfully treated by anterior colpotomy, with vaginal fixation of the uterus. Spinelli believes that retroversion with fixation frequently follows posterior colpotomy, and for this reason Kehrer adopted the anterior route. Dr Struthers last year

reported a case which Dr Hart had successfully treated by posterior colpotomy.

3. *Chronic Ovaritis with Adhesions (Perimetric).*—This was the first indication for which Duhrssen recommended the vaginal route to enable him to remove adhesions matting together the pelvic organs. He combined the operation with vaginal fixation in cases of retroversion, regarding the latter proceeding as helpful in preventing subsequent adhesions.

The presence of adhesions frequently causes no symptoms, as shown by their being found in post-mortem examinations of cases where no pelvic trouble had been complained of during life. Yet pelvic pain in many cases appears to have no other cause.

If the adhesions be recent, they may be removed by bimanual manipulation, as practised by Schultze and Thure Brandt. When a spectator of this plan of treatment by Thure Brandt some years ago, the impression I formed was rather that of a gymnastic display than a method ever likely to be adopted in this country.

If the adhesions are of long standing, abdominal section has frequently been performed.

The following are illustrative cases treated by vaginal section:—

CASE I. (æt. 23).—Complained of backache, aggravated by movement of the bowels, dating from an abortion twelve months previous to admission to hospital; last confinement two and a half years before that. On examination, uterus anteverted and enlarged. Left ovary enlarged, with extreme tenderness or pressure here. *Anterior Colpotomy*—Both ovaries adherent; adhesions separated by one finger introduced through the anterior fornix, the other hand acting through the abdominal wall. Both ovaries being found apparently unaffected were returned, and the operation completed.

CASE II. (æt. 28).—Pain in left side and dysmenorrhœa of three years' duration; married eight years—three children;

had been under prolonged treatment by douches and rest with little effect. *Posterior Colpotomy*—Left ovary fixed; right easily drawn down and inspected; adhesions surrounding left ovary removed by manipulation, and organ replaced.

CASE III. (æt. 40).—Pains left side and back, of ten years' duration, dating from a confinement at that time; under treatment by douches and rest on two occasions for six weeks with only temporary benefit. *Posterior Colpotomy*—Both ovaries fixed by adhesions, which were separated, and organs returned.

RESULTS:—In the first case, twelve months after operation, the report is satisfactory; in the second case dysmenorrhœa is relieved, but there is still pelvic pain complained of; and in the third case the result was complete relief two years after operation. Case II. illustrates the difficulty in deciding what treatment to adopt in cases where pelvic pain, associated with fixed ovaries, persists after prolonged general treatment. Such a case might come under those referred to by Hart when speaking of abdominal section for tubal disease in a recent address, where he says:—"While a low mortality is a *sine qua non* in such, we must not forget that an important point is to find out whether in the long run the ultimate result has in non-suppurative cases justified the mutilation. This holds especially true for neurotic cases."

4. *Prolapse of the Ovary.*—In the treatment of this condition, if the ovary be movable and associated with backward displacement of the uterus, the introduction of a pessary frequently suffices to give relief. If fixed, and palliative treatment fails, the removal of the ovary may be justifiable, as in the following cases:—

CASE IV. (æt. 18).—Complained of intense pain on defecation, of six months' duration. The uterus was retroflected; left ovary enlarged and prolapsed below it. Pessary treatment greatly aggravating the condition, the ovary was removed by posterior colpotomy, and the uterine displacement subsequently treated by a pessary with complete relief of symptoms.

CASE V. (æt. 28).—Backache, dysmenorrhœa, dating from confinement four years previously; uterus retroverted, with an enlarged prolapsed ovary on the left side. Treated for three years with pessary and plugs without relief. *Posterior Colpotomy* —Ovary removed; patient relieved and able to wear a pessary with comfort.

Extra-uterine Pregnancy.—The route to be adopted here depends on the nature of the case. If the symptoms point to a diffuse hæmorrhage from intra-peritoneal rupture without the formation of an hæmatocele, it is universally agreed that abdominal section, immediate, or as soon as the patient has rallied from the state of primary collapse, is the only treatment.

If the condition be diagnosed before rupture up to the eighth or tenth week, the intact tube may be removed by vaginal section. Duhrssen gives a table of nineteen cases operated on through the anterior fornix, most of them being cases of incomplete tubal abortion, with one death. Becker and Donald likewise report successful cases. MacEnrodt reports six successful cases operated on through the posterior fornix, removing the affected tube in each case.

In cases first seen after the formation of an hæmatocele, the line of treatment is one on which there is diversity of opinion. Many such cases get well without treatment, absorption slowly taking place. This, however, may require several months, during which time suppuration of the hæmatocele may occur, or pressure symptoms may continue. On this account some recommend abdominal section in all cases of hæmatocele, where the symptoms point to ectopic pregnancy as the cause. Kustner is of opinion that it is not advisable to operate through the vagina in any case, as the parts are not so readily seen as from above. In this opinion he is supported by Sänger, Fehling, and others. In retro-uterine hæmatocele, when the pouch of Douglas is distended with blood and causes symptoms, posterior vaginal section is probably the best line of treatment. This is approved of by Fritsch, Zweifel, and Kelly. The advantages given by Kelly are:—

(1) Tubes and ovaries are preserved.

(2) Clots are removed without opening up the general peritoneal cavity.

(3) The operation is practically free from danger.

Of twelve cases reported by him so treated, however, he had to open the abdomen once in order to arrest hæmorrhage from the sac.

The following are short notes of two cases of pelvic hæmatocele treated by vaginal incision :—

CASE VI. (æt. 22).—Complained of abdominal pain and vaginal hæmorrhagic discharge of three weeks' duration ; three children, youngest eight months. Symptoms appeared suddenly ten days after expected date of menstruation. On examination, uterus is felt above the symphysis, and pushed to the front by a hard, tender swelling felt through the posterior and left lateral fornix; temperature 101°, pulse 120. *Posterior fornix* incised, clots removed; cavity irrigated with sterilised water, and plugged with iodoform gauze; no trace of ovum found. Patient left hospital ten days after admission, and subsequent history is that of no pelvic trouble and another normal confinement.

CASE VII. (æt. 29).—Pain in lower part of abdomen and left side, with vaginal hæmorrhagic discharge of *six weeks'* duration. Symptoms came on suddenly after six weeks' amenorrhœa ; one child seven years old. On examination, a swelling, size of a cocoa-nut, behind and to the left of the uterus; incised through posterior fornix; irrigated and drained with gauze; removed on third day. Patient left hospital, by her own desire, on tenth day, feeling quite well. On examination three days later, there was still a slight swelling felt in the posterior fornix, with vaginal hæmorrhage. Fortnight later she was quite well, and nothing felt on pelvic examination, which condition continues now fourteen months after operation.

Ovarian Cysts.—Reference has already been made to the removal of small ovarian cysts through the posterior fornix by Atlee in 1857. This route has now been re-introduced

for the removal of ovarian tumours, although not with universal favour.

Schauta reports twenty-three cases of ovarian cysts removed through the anterior fornix, with one death. He limits the cases suitable for the vaginal operation: (1) To movable tumours; (2) to those free from adhesions to the bowel; (3) those non-malignant in character, malignant tumours not readily admitting of reduction in bulk. As it may, however, be difficult or impossible to diagnose those contra-indications before operation, the number of cases suitable for removal by this route must, according to this authority, be very limited.

Bumm reports five cases so treated; in one case the uterus had to be removed to arrest hæmorrhage, and in another the operation had to be completed by abdominal section. Wertheim reports two cases of large intra-ligamentary cysts removed through the vagina without opening the peritoneum. Fehling operated on seven large cysts through the anterior fornix, but is not a partisan to the operation on account of his inability in some of the cases to complete the operation by the vaginal route. Wound infection is regarded by some as the chief contra-indication to the vaginal operation. MacEnrodt and Lohlein both publish a list of successful ovariotomies through the posterior fornix, the tumours varying in size up to that of a child's head. In this country, Donald, in support of vaginal ovariotomy, records twenty cases with one death (hæmorrhage), and regards it as the better route in the removal of all cysts reaching as high as the umbilicus, and in the absence of indications of adhesions to the anterior abdominal wall.

My own experience of vaginal ovariotomy has been limited to the removal of cystic tumours not exceeding a lemon in size.

Case VIII. (æt. 27).—Complained of bearing-down pains of three years' duration, three miscarriages, no full-time children. On examination, a movable swelling the size of a turkey's egg was felt to the left and behind the uterus.

Operation.—Posterior vaginal incision; dermoid cyst enu-

cleated, pedicle ligatured, and iodoform gauze drain introduced; a febrile recovery; left hospital in fourteen days.

CASE IX. (æt. 18).—Married eight months, complained of dysmenorrhœa, frequent and painful micturition. On examination, movable tumour size of an orange felt behind the uterus. Posterior vaginal incision; a papillomatous ovarian cyst removed; operation completed as usual; a febrile recovery; discharged on the fourteenth day.

CASE X. (æt. 32).—Admitted to my ward from O. P. department on account of a hæmorrhagic discharge following an early abortion. On examination under chloroform, with view of ascertaining and removing the cause of the menorrhagia, a cystic movable swelling the size of a Tangerine orange was felt behind the uterus. The uterus was curretted and plugged with iodoform gauze, followed by posterior colpotomy to remove what proved to be a unilocular ovarian cyst. The patient had *not* been prepared with the same precautions as for abdominal section. The result was that on the following day there was abdominal tenderness, pulse 116; temperature 102°. Next day, tympanitis and increase of abdominal pain; pulse 122, temperature 102·4°. She had now the appearance of commencing septic peritonitis, and was ordered an enema containing ʒij of spirits of turpentine. This was followed by rather severe diarrhœa lasting several hours, but accompanied by improvement in general condition of the patient, which continued, and patient was discharged one month after admission.

In Diseases of the Appendages.—With Pean's proposal in 1886, to remove the uterus per vaginam in suppurative conditions of the appendages, originated the idea of removing them through the anterior or posterior fornix without extirpation of the uterus. That the uterus is unaffected to any serious extent *in many* such cases is shown by the frequency of pregnancy following unilateral removal of diseased appendages, and any inflammatory condition of the endometrium accompanying tubal disease can in most cases be satisfactorily treated through the dilated cervix.

In 1891 Lwoff reported twelve cases of tubal disease treated by posterior colpotomy, and Teploff about the same time published twenty-seven cases. In all, the appendages were deep in the pouch of Douglas, and adherent.

MacEnrodt advocates the posterior incision, and quotes in its favour five successful cases; while Duhrssen reports a long list of cases treated through the anterior fornix.

He regards the cases as most suitable for vaginal extirpation:—(1) Those where the tubal swelling is mobile. (2) Adherent but lying low in the pouch of Douglas, and free from adhesions to the lateral pelvic wall.

Smith reports eleven cases of vaginal cœliotomy for diseased appendages, including six cases of pyosalpinx. Of the latter, three recovered, two died, and in one it was necessary to complete the operation by abdominal section.

The difficulty in accomplishing the complete removal of tubal swellings through the vagina on account of adhesions, with the risk of injuring adherent viscera, is exemplified by the two following cases:—

Case XI. (æt. 31).—Was seen by me three years ago, complaining of more or less constant pain in the left iliac region, present previous to, but aggravated since, her marriage two years before coming under observation. She had not been pregnant, and there was no evidence to be obtained pointing to gonorrhœal infection. On examination there was found what I supposed to be an enlarged tender left ovary. I regarded the case as one of ovaritis not requiring operative treatment, and ordered rest and douches. This treatment she carried out for a couple of months, when she resumed her household duties for eighteen months, during which period there was still pelvic pain complained of.

Three weeks previous to my seeing her for the second time the pain had become greatly aggravated. On examination I found extreme tenderness in the left iliac region, with general abdominal tenderness; temperature 104°, pulse 136. P.V. there was found a tender oval swelling behind and to the left of the uterus. This I regarded as a pus tube or suppurating ovarian cyst. On the following day I opened through the posterior

fornix, with the hope of removing the swelling, which proved to be a pus tube with adherent ovary. During my manipulation to separate adhesions the tube burst, with escape of fœtid pus through the vaginal wound. After irrigating with sterilized water, I made further attempts to separate firm adhesions to the rectum, but as I saw risk of tearing the rectal wall, I sutured the edges of the tubal opening to the vaginal wound, and plugged with iodoform gauze. This I removed on the third day, and replaced it with a drainage-tube retained for ten days. The discharge gradually ceased, and in six weeks the patient was able to resume household work. Her condition now, one year after operation, is quite satisfactory. There is no pelvic pain. Menstruation is regular and painless.

Case XII. (æt. 24).—Married five years, no children; attended my Out-patient Department complaining of left-sided pain and backache, dating from shortly after marriage, and aggravated by menstruation. Clear evidence of gonorrhœal infection. Per vaginam there was found a cystic, mobile swelling, behind and to the left of the uterus, about the size of a hen's egg, regarded as probably tubal. *Posterior colpotomy* showed it to be a hydrosalpinx (left-sided), having all the appearance of a coil of small intestine. It was extremely thin-walled, and during manipulation, to ascertain its connections, it burst with escape of clear, watery fluid. It was adherent above. I made no further attempts to remove it, as from the thinness of the walls and nature of the fluid I did not consider this would be any great advantage. I stitched the opening to the vaginal wound. The results so far, eight months after operation, are satisfactory. On examination now there is no pelvic pain or trace of pelvic swelling.

With regard to myoma of the uterus I have not yet seen a case which warranted enucleation through the anterior or posterior fornix. Duhrssen reports eighteen cases of small myomata so treated, with two deaths, but those were complicated with suppurative disease of the appendages. The difficulty in accepting this plan of treatment is obviously the rarity in such cases of symptoms demanding operative interference.

The remaining conditions which may be treated by the vaginal route are:—

1. In cases of phthisis, cardiac affections, and other conditions likely to be aggravated by subsequent parturition. Duhrssen advocates and reports eighteen cases where the tubes were exposed, ligatured, and divided by anterior colpotomy.

2. For diagnostic purposes, as, for example, cancer of the cervix, to ascertain the extent of glandular infection, as recommended by Martin.

3. Cases of perforation of the uterus formerly treated by extirpation, by opening either through the anterior or posterior fornix, the wound may be exposed and sutured.

4. Tubercular ascites. Lohlein reports six cases treated by incision through the posterior fornix. In five of these the result one year after operation was satisfactory, as regards general condition, temperature, and non-recurrence of abdominal swelling.

Advantages claimed for the vaginal over the abdominal route are:—(1) Shorter convalescence. Fourteen days as compared with three to four weeks. (2) No abdominal cicatrix, therefore no risk of hernia, or subsequent formation of intestinal or omental adhesions. (3) Less shock on account of the peritoneum being less exposed. (4) Drainage, if necessary, is best carried out through the posterior fornix.

Its drawbacks are:—(1) On account of the limited space dense adhesions are more difficult to manage, and consequently greater danger of wounding viscera (bladder and rectum). (2) Greater difficulty in rendering the vagina aseptic. The latter objection, however, is probably exaggerated.

Cases suitable for the vaginal route (other means of treatment failing) I believe to be:—(1) Mobile retroflexion, causing symptoms at or about the menopause. (2) Chronic ovaritis with adhesions. (3) Prolapse of the ovary with fixation. (4) Ovarian cysts, small, whether dermoid, simple, or papillomatous. (5) Pelvic hæmatocele. (6) Unilateral, mobile, tubal swellings.

Cases unsuitable for this treatment are:—(1) Large tumours. (2) Old standing tubal disease with dense adhesions, where the complete removal of the appendages is necessary.

Professor Simpson thought the communication of Professor Kynoch a very interesting and valuable one. It contained the record of important observations and focussed information that was widely scattered in gynæcological literature. He (Professor Simpson) agreed, generally, with the author as to the indications for vaginal cœliotomy, but had himself no experience of the anterior colpotomy except as a stage in hysterectomy. He had never been convinced that it was desirable to deal with the posterior displacements through the vaginal roof. To be sure, Neugebauer had diligently collected from all kinds of records an imposing array of instances where pessaries have done mischief. But if one thought of the crowds of women who wore pessaries, the wonder rather was that more damage was not done by them, and there was no inherent danger in their application, whilst one could never open into the peritoneum without recognising that the operation was attended with some degree of danger. He was struck with the statement of Dr Alexander of Liverpool, in his recent brochure, that one of the results that might follow the shortening of the round ligaments was the relaxation of uterine adhesions, and as such adhesions had been regarded as one of the indications for vaginal cœliotomy in posterior displacements, the cases in which peritoneal interference was admissible became more restricted. The dangerous pregnancies and labours that had followed vaginal fixation formed an absolute contra-indication to any such operation in women during the reproductive period of life. He (Professor Simpson) agreed with the author also in regard to the value of this mode of treatment in some cases of hæmatocele which, in his own experience, had given satisfactory results. In general, he (Professor Simpson) preferred the abdominal route in the great majority of operations on the pelvic organs. Especially when the patient was in the Trendelenburg position, a much more satisfactory view was obtained of the field of operation, so that one felt more sure of all his proceedings. In considering the choice between abdominal and vaginal cœliotomy, there was one point that sometimes guided to a decision, viz., whether the patient was parous, or nulliparous, or virgin. In the latter conditions the narrowness of the vaginal orifice and canal made the vaginal operation

difficult or impossible. In looking at the history of the vaginal operation, due credit should always be given to Dr Battey of Rome, Georgia, who, in proposing and carrying out what he called "Normal Ovariotomy" for inducing the menopause, removed the ovaries through the vaginal roof, and established the feasibility and safety of the operation nearly thirty years ago.

Dr Brewis considered the outstanding advantages of vaginal section to be the absence of an abdominal scar and of the possibility of weakening the abdominal wall, and the short and easy convalescence. The method compares unfavourably with abdominal section in the matter of obscurity and difficulty in treating adhesions. There may also be difficulty from want of room in a small pelvis, and danger from hæmorrhage owing to the high position of the ovarian artery, and the difficulty of securing it. He considered the following cases specially suitable for vaginal section :—

1. *Early ectopic gestation.*—Where the sac occupies the pelvis, bulges down the vaginal roof, and pushes the uterus upwards and forwards, the swelling is roofed over by adhesions, is practically extra-peritoneal, and is easily and safely evacuated by vaginal incision.

2. *Ovarian tumours which are partly pelvic.* — Provided there are no intimate adhesions over the upper part of the tumour the operation is easily and satisfactorily accomplished. If the operation, owing to adhesions, cannot be completed by the vaginal route, opening the abdomen adds little to the risk.

3. *Evacuation of pus.*—Every pelvic abscess that does not point above Poupart's ligament should be treated by vaginal section. The evacuation of even a little pus may bring down temperature and hasten resolution. An incision into a cellulitic exudate may have the same good result. Evacuation is specially useful as a temporising measure when removal of pus tubes by abdominal section would be fatal. The tubes can be removed afterwards by abdominal section when the patient's general condition is improved. Ascitic fluid may also be safely evacuated through the posterior fornix.

4. *Exploratory incision.*—The advantages of the vaginal route for exploratory purposes are very manifest.

5. *Conservative operations.*—Adhesions can be separated, and sections of the ovaries and tubes can, in many cases, be made with great ease by this method.

6. *Diseased uterine appendages.* — When the ovaries and tubes are low placed they may be easily removed by anterior or posterior colpotomy. If the uterus is retroverted the fundus may be secured to the incised anterior vaginal wall after the appendages have been removed.

Dr Brewis had performed eight vaginal sections, exclusive of hysterectomy and abscess cases. Three of the cases were ovarian cystomata, and one was a dermoid tumour of the ovary. In these cases the tumours were of considerable size, reaching to the umbilicus, and the operations presented no difficulty. He also operated on three cases of diseased appendages and on one extra-uterine gestation. All the cases recovered easily and rapidly.

Dr Haultain had listened with much interest to the arguments brought forward by Dr Kynoch in favour of the vaginal route for removal of diseased pelvic organs. Personally he had only a limited experience of this method, as he had found the abdominal route so satisfactory that there was no inducement to depart from it. Although admitting the advantages of a shorter convalescence, he thought that by no means counterbalanced the disadvantages of the want of sight in the performance of the operation. When adhesions existed, these by the vaginal route had to be separated in a haphazard way, similar to what used to be done in the earlier days of abdominal section with a short incision. This, however, with the advantages of the Trendelenburg posture, pelvic operations by the abdominal route were immensely more satisfactory, by reason of the fact that the operator could follow by sight all his manipulations. The abdominal scar was in the main a sentimental objection; the risks of ventral hernia were extremely slight now that the practice of drainage through the abdominal wound had been almost abandoned. For the evacuation of drainage of suppurating hæmatoceles and a similar treatment of embedded pyosalpinx the vaginal incision was without question the correct one, but for the removal of uterine appendages and ovarian and

other pelvic growths he would strongly advocate abdominal incision.

Dr Church had seen a good many cases of ovarian and uterine tumour in which the questions arose whether the operation for removal should be done through the abdominal wall or through the vaginal roof. He was of opinion that almost all tumours should be removed by opening into the abdomen. If the surgeon should attempt the vaginal operation and fail, and then open the abdomen, he considered that there was much more risk to the patient from shock, than if the abdominal operation had been primarily done. Before the second operation both patient and operator might be well-nigh exhausted.

Dr Kynoch replied.

VII. PYOSALPINX REMOVED BY LAPAROTOMY IN THE EARLY PUERPERIUM.

By R. Milne Murray, M.A., M.B., F.R.C.P.Ed., F.R.S.E.

The recent literature of operative gynæcology contains a considerable number of cases in which the abdomen has been opened during pregnancy and the puerperium for the removal of a suppurating tube, both before and after rupture. The results of this procedure have been, in the main, so gratifying that we may regard it as an established method of dealing with this grave complication. Still the number of recorded cases is not so great as to warrant us in regarding such interference as a commonplace of practice. Further, almost every case has features of its own, either in its history, its clinical manifestations, or in the details of the operation, and this, along with the fact that the diagnosis of the precise condition of things to be dealt with is not always too clear, renders the account of any case falling under this category a matter of some interest.

The diagnosis of a pyosalpinx in early pregnancy—say up to the third month—is a matter of comparative simplicity. Careful bimanual examination will determine the presence of an enlarged tube in one or other fornix, or sometimes behind the uterus, and the recognition of such a condition, considering

the risks involved, as pregnancy advances, demands immediate operative interference. The fact that it may be sometimes difficult to distinguish this from an extra-uterine gestation only accentuates the wisdom of prompt measures. In the last three months of pregnancy the case is different. The diseased tube may have lain fairly quiescent during the progress of the pregnancy, and subjective symptoms of local disturbance may be absent, or so obscure as to attract no special notice. Moreover, if pain is complained of, the size of the uterus interferes with accurate exploration of the pelvis bimanually, and, besides this, the ovary and the tube are raised out of the true pelvis, and withdrawn beyond the reach of the ordinary sources of diagnosis.

In such a case the first hint of trouble may come from the rupture of the tube, or the ejection or oozing of its contents through the abdominal opening, setting up a more or less definite peritonitis. But even then, with the diagnosis half established, the question of operative procedure is a complex one. The removal of the tube and the necessary treatment of the peritoneum is a very different matter when the abdomen is filled by a full-term uterus, from what it is when the uterus has only just emerged from the true pelvis. From considerations such as these, it seems to me the case which I wish to put on record to-night has some interest.

The patient consulted me first in August 1895. She was then thirty-one years of age, had been married two years, and had never been pregnant. She complained of profuse periods and great debility, which she attributed to the menstrual losses. These had come on after severe mental and physical strain in connection with the illness of a near relative. I found the cervix hard and small, the uterus of normal size, but sensitive and drawn to the left side. The left fornix was flatter and fuller than usual, but no definite condition could be made out. I advised the use of hot douches, with iron and other tonics, and small doses of ergot at the periods. Three months afterwards she reported herself quite well.

Next year she became pregnant, and in the beginning of 1897 she was delivered normally of a daughter.

I again saw the patient in August 1898, when she complained of a recurrence of her former symptoms, and I recommended a similar course of treatment. I was unable to examine her at this time, as her period had come on during the journey into town. She promised to come back soon and report herself. I did not, however, hear from her for about three months, when she wrote informing me she was again pregnant. I heard nothing more of her until the 12th July of this year, when I received a telegram asking me to see her at once. When I arrived I found that for some months she had been complaining of a pain in the left ovarian region, which occasionally had been very severe, compelling her to lie down for some hours at a time. On the morning of the 7th, that is five days before I saw her, she was awakened by an excruciating pain in the left side, so severe as to induce faintness. Poultices and laudanum relieved this, and next day she was able to sit up a little. The temperature was taken that night, and found to be 101·5°. On the 9th the temperature was still 101·5°, and that evening labour pains set in. The os dilated to the size of a half-crown piece, after which the pains ceased entirely. On the 10th and 11th matters remained much the same. The temperature varied from 100° to 101°, and there was a constant dull ache in the left side with occasional exacerbations. When I saw her on Wednesday the 12th, she was lying on her back with her knees drawn up. She had a curious anxious expression, and her complexion, usually rather florid, had assumed a peculiar yellow tinge. Her temperature was 101·5°, and her pulse 98, and rather compressible. Gentle pressure in the left ovarian region caused wincing, but she thought that, on the whole, the pain was less that day than it had been since the 7th. The vagina was moist, and the os admitted two fingers. The cervix was quite taken up and the membranes bulged slightly. Pressure in the left fornix caused some pain, but nothing abnormal could be felt. The head was freely movable and had not engaged in the brim.

On a careful review of the history and symptoms, I felt at

a loss to account for the condition except on the assumption of some tubal mischief being present. The condition of the left fornix, in 1895, suggested an old-standing inflammation in the left broad ligament or its associated structures, and the continued discomfort complained of in that region, in the later months of pregnancy, suggested a recrudescence of this condition. Further, the sudden acute attack of the previous week, followed, as it was, by a continued rise of temperature, pointed to an escape of pus into the abdominal cavity. With this idea in my mind, I considered the question of opening the abdomen there and then, but with the uterus undelivered, I thought it would be next to impossible to reach the deeper parts of the peritoneum, where I presumed the trouble was, and I felt that any attempts to empty the uterus hurriedly would be complicated by risks much greater than were justifiable. On the other hand, the state of the os and cervix showed that labour could not be long delayed, and I accordingly advised waiting until delivery occurred, keeping the temperature and other indications under close observation. Labour set in at midnight on the following day—the 13th—and at 2·45 A.M., the os being fully dilated and the head low down, forceps were applied, and a male child was safely born. On the morning of the 14th the patient was sick and prostrate. Her temperature 96·6° and the pulse 90. As the day wore on she seemed to improve, and took some nourishment. About 8 P.M. the temperature was 101°, pulse 93. There was some thirst, and no pain was felt, except on pressure, in the left side. The lochia was normal and urine had been passed. At 8 P.M. sulphonal was given, and she was asleep in half-an-hour. These facts were communicated to me in a letter which I received at 8 A.M. on Saturday morning, the 15th. Half-an-hour later I received a telegram asking me to see the patient at once, as she had become worse. I took with me the instruments required for an abdominal section, and reached the patient at mid-day. I found her looking exceeding ill. The temperature was 103·5°, the pulse 130, thready and compressible. The tongue was thickly furred, and the expression profoundly anxious. She lay with both legs drawn up. There was marked tympanites, the uterus lay in the middle line, the

fundus at the umbilicus. There was much tenderness all over the left side of the abdomen, but especially just over Poupart's ligament. The lochia had been rather profuse, some clots having come away, but it seemed quite sweet. She complained of thirst, and there had been much sickness and retching during the forenoon. Per vaginam the left fornix felt fuller than normal, and pressure caused great pain, especially when any attempt was made to displace the cervix to the right. The patient was obviously very ill, and the symptoms had come on so soon and so urgently after labour that I felt if anything was to be done there was no time to be lost. Dr Gordon, of East Linton, who saw the case with me, was of the same opinion, and I had no hesitation in advising opening the abdomen. I telegraphed for Dr Lackie, who, at great personal inconvenience, answered my summons, and arrived shortly after three o'clock.

The room in which the patient lay was anything but an ideal one for an abdominal operation. It was small, and its one window looked, at a few feet, into a dead wall. Yet the patient was so feeble that I dared not risk moving her into another room, the nearest available one being at the other end of a long narrow passage. We, accordingly, arranged a table as best we could, and after she was under chloroform, which was most skilfully given by Dr Gordon, we lifted her on to it.

On opening the abdomen I passed my hand into the left side of the pouch of Douglas. The walls of the pouch were crossed everywhere by fine recent adhesions which gave readily. Without difficulty I brought out the left tube and ovary. The tube was intensely congested, of a dark crimson colour, and though much dilated, was to all appearance empty. The ovary, about twice the normal size, was clotted over with recent adhesions of a bright red colour. There was no abnormal amount of fluid in the peritoneal cavity. The intestines were so much distended with gas that it was with the greatest difficulty we could keep them in the abdomen, and some coils which escaped gave us much trouble before they were returned. I ligatured the broad ligament as near the uterus as I could, and removed the tube and ovary.

With some trouble I brought up the right tube and ovary which were well behind the uterus. The tube was normal; the ovary was also normal, except that it was dotted over with a few adhesions like the other. I returned both to the abdomen. The peritoneal cavity was then washed out with several quarts of 1% lysol solution. Nothing in the shape of purulent material came away with the washing.

The question of drainage was now considered. The only possible method seemed to be an opening through the vaginal roof, but I shrank from this when I thought of the vicinity of the lochial discharge and its unspeakable potentialities. But the demand for drainage of any kind did not seem very pressing. We had removed the supposed source of the mischief, and the peritoneum did not seem extensively, but rather locally, affected. Accordingly, leaving about a pint of lysol solution in the cavity, I closed the wound. The uterus had bled freely during the operation and the necessary handling of the organ, so I thought it advisable to wash out the cavity with lysol solution at 120° F. Some large clots came away, and the uterus contracted firmly. A copious enema was given, and the patient put to bed. At 5.30, when we left, the temperature was 101° and the pulse 100.

She passed a good night, without sickness, and in the early morning took a few spoonfuls of chicken jelly with relish. At 9 A.M. next morning the temperature was 98·8°, and she was free from all pain. I saw her on Monday and found her very comfortable; pulse 90 and temperature normal. From this time onward she made an uninterrupted recovery. The wound healed perfectly.

Six weeks after the uterus was 3 in. by the sound, and nothing abnormal could be felt. The uterus lay in the middle line. Since the operation she has menstruated in a perfectly natural fashion, without pain.

On examining the amputated tube I found that the canal was so much dilated that a thick pair of catch forceps could be passed along to within a quarter of an inch of the uterine end with great ease. The fimbriæ were short and granular on their inner aspect. On stripping the tube a minute drop of yellow purulent material escaped at the uterine end. Un-

fortunately the specimen was placed by mistake in strong corrosive solution, so that no culture could be made to determine whether a micro-organism was present.

Among several matters of interest in the history of this case there is one feature to which I should like to direct a moment's notice. If one does not wholly misinterpret the attack of acute pain on the 7th, on that day an escape of purulent matter occurred from the diseased tube. Constitutional symptoms of a marked character appeared then, and continued. But it is remarkable that until the 12th, that is five days later, no profound manifestation occurred. This, on the other hand, appeared with great suddenness twenty-four hours after labour. Are we to suppose that this sudden manifestation appeared as the result of what is termed the "strain of labour," a term in common use, not always, if ever, associated in one's mind with any very definite meaning? Or are we to seek for an explanation of the sudden change for the worse in the patient's condition, in the change from pregnancy to the puerperium. For five days the morbific influence, whatever it may have been, was at work in the peritoneal cavity, but so long as pregnancy lasted the mischief made little progress—so far, at least, as any outward sign went to show. But within twenty-four hours of the entry on the puerperium a change occurred so profound and overwhelming that no one who saw the patient doubted for a moment that she was in imminent peril. It seems to me only reasonable to look for an explanation of this phenomenon in some subtle change in the vital processes or tissue metabolism which follows the passage from the state of pregnancy to the state of the puerperium.

A comparatively limited experience of practical obstetrics suffices to show us that a puerpera is in a state of most unstable equilibrium. Her proneness to deviate from the normal must be accounted for by something more concrete than the "strain of labour." It is obvious that the sudden withdrawal of the child and the change in the physiology and tissue chemistry of the mother which this means, must involve complicated processes of re-arrangement which may themselves become disturbed, or in their progress render her less capable of resistance to morbid influences. When an army is rearranging

its units, and changing the order of its formation, its power of resistance is at a minimum, and it is then least able to withstand the onslaught of the enemy.

The most anxious days to the obstetrician are those of the early puerperium, and the case recorded is an illustration of but one in a long catalogue of possibilities he must keep in mind.

I take this opportunity of thanking Dr Lackie, not only for his skilful assistance, but also for the moral support he gave me in a somewhat anxious experience.

Professor Simpson thought the Society was much indebted to the President for the record of this very interesting case. The sudden development of dangerous symptoms was parallel to what was sometimes observed in women who were delivered when they had become the subject of some zymotic disease, and in whom the symptoms of mischief assumed an alarming phase when the puerperal changes set in; and the suggestion of the President was not only ingenious but probably correct, that these changes favoured the development of septic processes. The happy result of the operative interference was another proof of the importance of having recourse to abdominal section in pelvic puerperal inflammations. In this instance one got the impression that if nothing had been done the patient would have died, and that removal of the diseased tube and ovary had saved her life.

Dr Haultain congratulated Dr Murray on the result of the case recorded. The indications for laparotomy were certainly clear from a symptomatic point of view, but the signs were by no means well defined, and it reflected all the more credit to Dr Murray that he undertook the operation guided practically by symptoms only in his diagnosis. There could be little doubt he saved the patient's life, and the case afforded another striking example of the great value of exploratory abdominal incisions.

Dr Lackie said that he had listened to the President's paper with special interest, since he had had the pleasure and privilege of assisting at the operation. There was no doubt that Dr Murray by his prompt interference had saved the patient's

life. It seemed to him, however, that occasionally cases must arise in which it was extremely difficult to know whether to operate or not. Last August he had a case in which, after a normal labour, the patient, on the third day, developed after a rigor acute pain in the left side and a high temperature. He at once thought of local septic peritonitis, but fortunately within thirty-six hours the patient's temperature fell to normal, and she became apparently perfectly well. On the 6th day all the symptoms recurred, high temperature, profuse perspirations, and acute pelvic pain. Nothing abnormal could be made out on bimanual examination, and therefore he considered operation inadvisable. Fortunately by the 8th day the patient was quite well and had remained so ever since. He congratulated Dr Murray on the success of his operation.

Dr Milne Murray replied.

VIII. NOTES ON A CASE OF SUDDEN DEATH FOLLOWING LABOUR, DUE TO CARDIAC DISEASE AND PNEUMONIA.

By G. W. Simla Paterson, Physician, Cowgate Dispensary, Edinburgh.

As cases of sudden death during pregnancy or the puerperium are comparatively rarely met with, I venture to bring the following case under notice:—

On Sunday, 5th November last, at midnight, I was asked to see Mrs M., æt. 32, secondipara, who expected to be delivered about the middle of November. I found her in a condition of extreme breathlessness, amounting to orthopnœa, accompanied by very frequent spasms of coughing and expectoration of considerable quantities of red blood, mixed with mucus. She complained of a sensation of pain and oppression in the region of the heart, and volunteered the statement that she was suffering from asthma, having had two similar, though not so severe, attacks during the course of her pregnancy.

On examination of the chest, there was found to be comparative dulness at both bases posteriorly, but the breath sounds were completely hidden by the abundant coarse crepitations which were present all over the chest. The heart's

action was so rapid and tumultuous that no murmurs could be heard.

She was much cyanosed, the respirations being between 50 and 60. The temperature was 101°, and the pulse 144, feeble but regular, except during the spasms of coughing. There was no œdema of the lower extremities. Labour had not commenced.

About 8 o'clock the following morning I was sent for, and on arriving found the child and after-birth born. They were lying on the floor, while the patient was sitting on the edge of the bed, being too breathless to lie down. The uterus was firmly contracted, and there was no hæmorrhage. I put her to bed and performed her toilet as speedily as possible, and stimulated her freely with whisky and strophanthus. Dr Haultain saw her with me early in the forenoon, and concluded the case was one of pulmonary thrombosis, and gave a very hopeless prognosis.

In the afternoon, as her condition was getting worse, the cyanosis increasing and the pulse getting weaker, I performed venesection, drawing off about 12 oz. of blood, and injected $\frac{1}{60}$ gr. of sulphate of strychnia subcutaneously. This relieved her symptoms for the time, but she rapidly sank, dying at 8 P.M., exactly twenty-four hours from the onset of her symptoms.

Previous History.—This was a very difficult matter to ascertain, as the patient was formerly quite unknown to me, was amongst complete strangers, and was too ill to give any satisfactory information herself. She had borne a child four years previously, who is still alive. She denied ever having had rheumatic fever, but stated that she had suffered from chorea when a child, and that during the present pregnancy she had on several occasions felt choreic movements. The most important fact elicited was this, that twice during her pregnancy, namely, between the second and third months, and at the seventh month, she had attacks of breathlessness with hæmoptysis, exactly similar to the present one, but of less severity, from both of which she had entirely recovered. On the day on which she took ill she had her dinner as usual, and at four o'clock went out to call for a friend, returning at seven o'clock complaining of breathlessness, which she attributed to the wind

which was high at the time. Dr Harvey Littlejohn kindly performed a post-mortem examination next day, which revealed the following conditions:—

The uterus showed the normal appearances after labour. The pelvic veins contained ordinary post-mortem clot. The heart was the seat of old-standing endocarditis. The aortic valves were much thickened, and covered with vegetations, giving rise to aortic stenosis. The mitral valves also were thickened, the orifice admitting the little finger with difficulty. Both aortic and mitral stenosis were therefore present. Both ventricles were hypertrophied, and both auricles dilated. The pulmonary valves and arteries were healthy.

The left lung was slightly adherent to the thoracic wall. On section, the upper lobe was congested and œdematous, while the lower lobe was markedly consolidated. The right lung was also adherent; its upper lobe was œdematous and congested; the middle lobe was in the condition of splenisation, and sank in water, while the lower lobe also was congested.

Microscopic examination revealed brown induration, chronic congestion, and a recent fibrinous pneumonia in addition, rendering the lung quite solid.

The left kidney was completely cystic, and on section was found to contain a large quantity of tubercular pus. The right kidney had its capsule adherent, contained one small cyst, and was the seat of chronic nephritis, the cortex being narrowed and the tubules diminished. The microscope showed chronic cirrhotic changes, to which were added an apparent recent congestion with marked epithelial changes of a granular nature in the tubules of the cortex.

The liver was slightly fatty and friable, and the spleen was somewhat adherent, but otherwise healthy. No microscopic examination of these organs was made.

The stomach and intestines were greatly distended with gas, and the former contained a quantity of tarry-looking fluid, probably altered blood which the patient had swallowed, mixed with Bovril, etc., but its mucous membrane showed no congestion. There was no ascites.

The clinical features and post-mortem appearances described

are, at first sight at least, difficult to reconcile with each other. The evidence of chronic cardiac and pulmonary mischief of an exaggerated type, as revealed post-mortem, seem to have given rise to little discomfort to the patient during her pregnancy, and were not associated with the clinical features which one would have expected to be present, and at the same time no characteristic symptoms of the onset of pneumonia which had evidently been present for some time were complained of.

It is well known that pregnancy tends to exaggerate pre-existing cardiac lesions; and although, if they be of minor severity, pregnancy and labour may be completed without any untoward symptom, yet in lesions of a grosser type, especially if the mitral valve be affected, symptoms of interference with the circulation usually manifest themselves at an early period in the gestation, and may lead to premature expulsion of the uterine contents. In other cases during pregnancy symptoms may be absent, but during and after labour acute pulmonary congestion frequently causes the death of the patient.

In the case in point, however, sudden grave pulmonary symptoms were developed late in the pregnancy, and evidently were the primary cause of labour pains being started, and, as was natural to expect, the rapid demise of the patient after labour had been completed.

That mitral disease of so very advanced a type should have been present without giving rise to symptoms of backward pressure, such as œdema of the extremities, ascites, etc., is at once interesting and instructive, and would appear to be accounted for by the marked compensatory hypertrophy of the right ventricle, by which means the pulmonary circulation was maintained, notwithstanding the fact that the lungs showed evidence of venous congestion, which must have been present for some considerable time.

The sudden onset of symptoms would appear, from the condition of the lungs found post-mortem, to have been due to a superadded pneumonia, which, acting in association with the already highly congested state of these organs, was sufficient at once to entirely upset the pulmonary circulation and cause the death of the patient. As was to be expected, the somewhat premature onset of labour resulted, and greatly increased the

gravity of the condition, it being well known that in pneumonia expulsion of the uterine contents precipitates a fatal issue. Indeed, the wonder is that with such a variety of complications the patient survived as long as she did.

Although wrong in the actual diagnosis of the case, much may be said in support of the decision arrived at, namely, pulmonary thrombosis or embolism. The intensely sudden onset of symptoms, the hæmoptysis, air, hunger, cyanosis, and tumultuous cardiac action, combined with absolute want of impairment of intellect, and a keen sense of her critical condition, which were maintained up to the last, form practically the typical features of this lesion. On the other hand, a retrospective study of the history of the case, and the previous similar attacks, should perhaps have led one to consider a cardiac source of the symptoms. Physical signs, however, were impossible to acquire, owing to the pulmonary accompaniments which obscured the cardiac sounds.

The possibility of pneumonia being present certainly suggested itself at first, but the intensely sudden onset of symptoms unattended by the premonitory indications of that disease, led me to look for some other explanation of the condition, even although there was dulness on percussion of the chest at both bases posteriorly. Certainly, on reflection, one cannot help thinking that pneumonia, under ordinary conditions, would offer the most reasonable explanation of the urgent symptoms, as a cardiac origin would not be expected at so late a period of pregnancy, while pulmonary thrombosis before the onset of labour is naturally unlikely. Not only, however, were the ordinary symptoms of pneumonia marked by the absence of premonitory indications and the comparatively low temperature of 101°, but also by the exceedingly free hæmoptysis. The diagnosis, therefore, of the case must be considered to be one of great difficulty, the conditions present suggesting the presence of any one of these lesions without their being exclusively characteristic.

Altogether, exclusive of the cardiac and pulmonary conditions, the diseased state of the kidneys seems to me to be of more than passing interest. That such gross lesions of these organs should exist at the end of pregnancy without having

given rise to symptoms indicative of renal insufficiency, must be looked upon as of importance in relation to the supposed kidney origin of eclampsia. It was evident that her renal function was entirely performed by one kidney, and that an unhealthy one, which showed, in addition to cirrhosis, subacute inflammatory changes of the epithelium, so often met with in eclamptic cases. In other words, a single diseased kidney was sufficiently able to cope with the extra strain thrown upon it during pregnancy, a fact which strongly points to eclampsia being the result of impaired functional activity in some other organ.

Many cases of pregnancy complicated with heart disease have been recorded, but in the majority of these the subjects have been known to suffer from cardiac disease long before full term has been reached, and have attained that period owing to careful treatment of their cardiac condition, while in others, symptoms have arisen during or immediately after labour; but in this case, however, the patient's first complaint was made within twenty-four hours of the fatal termination, the severe heart symptoms developing towards the end of gestation, but apparently independent of labour. They were in all probability caused by the sudden development of pneumonia, and combined with that condition were the cause of labour pains setting in, and were not, as is usually the case, the result of the severe extra strain thrown upon the heart by the sudden venous engorgement during and after the third stage of labour.

Dr Haultain thanked Dr Paterson for his extremely lucid description of this interesting case, and congratulated him on the able manner in which he had unravelled its complexities. As the culprit who had wrongly diagnosed the conditions as pulmonary thrombosis, he would, under ordinary conditions, have had to defend his position, but this Dr Paterson had so thoroughly done that such was unnecessary. He could only say that if a similar case was to come under his notice again, he would still have the greatest difficulty in arriving at a correct diagnosis. He agreed with Dr Paterson that the kidney condition was full of interest in its relation to the subject of eclampsia; it

certainly lent strong evidence in support of the cause of convulsions being due to something more than mere renal insufficiency.

Dr Paterson replied.

MEETING III.—JANUARY 10, 1900.

DR MILNE MURRAY, *President, in the Chair.*

I. The following gentlemen were elected Ordinary Fellows of the Society:—O. St John Moses, M.B., C.M., 11 Argyle Place, Edinburgh; Charles Wakeham Holmested, L.R.C.P. & S.E., L.F.P. & S.G., Tuxford, Newark, Notts; and Donald Macgregor, M.D., Spring Mount, Jedburgh.

II. *Professor Simpson* showed SPECIMENS removed from a patient who on admission to the Maternity Hospital had crepitation in the left groin; the vagina and cervix were severely torn, the vulva swollen, the brim narrow, and the fœtus alive. Cæsarean section was performed. The child died from fracture of the frontal bone caused by forceps, and the mother a few days later of peritonitis.

III. *Dr J. W. Ballantyne* showed a TERATOMA which had been removed by laparotomy from the abdomen of a female infant two months old. The birth of the infant was delayed on account of the large size of the abdomen, and after birth it continued to increase, and the child was brought to the Manchester Children's Hospital. It was there found on examination that there was an abdominal tumour, partly cystic, partly solid, situated more especially in the left and upper part not connected with the liver. This was tapped when it became possible to make sure that the mass was somewhat movable. The tumour rapidly regained its original size, and the child was transferred to the Surgical Wards, where Mr Wright performed laparotomy, and with some difficulty removed the mass from the lesser cavity of the peritoneum. The child showed much shock at the time, and died the same day. Only

the abdomen was opened at the autopsy, and it was discovered that the tumour had not been connected with the vertebræ or muscles or with any of the viscera; the uterus, ovaries, and tubes were normal in every detail. The tumour might be called a teratoma of the abdominal cavity, or a fœtus in fœtu, or a fœtus engastro-amorphus. In addition to the cystic part there was a solid disc of tissues, showing skin on one aspect, adipose tissue and cartilage, etc., in the centre, and intestinal coils on the other aspect, which looked towards the interior of the cystic cavity. It had been sent to Dr Ballantyne for report, and he intended to give a full account of its pathology at a future meeting of the Society.

IV. ALBUMINURIA, MULTIPLE PREGNANCY, PAPYRACEOUS FŒTUS, AND PLACENTA PRÆVIA.

By JAMES RITCHIE, M.D., M.R.C.S. Eng.

MRS R., æt. 32, was in her earlier life somewhat rheumatic and liable to frequent attacks of gastro-intestinal catarrh and consequent anæmia. She was married in 1895, and on 21st January 1896 she was delivered at term of a healthy girl. She had enjoyed good health during her pregnancy and made a good recovery. She did not make a very good nurse, but continued to suckle for ten months and a half. After weaning, menstruation recurred regularly till the commencement of 1899. Her last period began on 28th February. On 22nd July the writer was called to see her in consequence of severe headache, shortness of breath on going upstairs, and debility. The face, feet, legs, and thighs were much swollen, urine was scanty and contained a large amount of albumen—it became nearly solid on being boiled, but there were no tube-casts and no blood. Appetite was very poor, she was squeamish, headache was severe, little sleep, and the pupils were widely dilated. The blood was not examined for the microbe described by Leoniovitsch under the name of planococcus of eclampsia.

The treatment adopted was rest in bed, the bowels freely moved, a mustard blister to the nape of neck, a teacupful of water or of whey every two hours, no other food, and fifteen

grains of bromide of sodium four times a day (in consequence of sickness very little of this was taken). The following day the urine was markedly increased; it contained less albumen, and headache was less severe. After a few days the urine became copious, and there was such improvement, that milk and water were given, and later some toast. After ten days œdema was gone, there was no headache, and the albumen in urine was only a trace. A little liberty in diet was allowed, simple milk puddings, tea, and later, white fish. Still later the patient was allowed out of bed, the urine being examined after each change in treatment. After some weeks she was allowed out of doors in fine weather.

On 20th September the writer was summoned because of slight hæmorrhage; this had first occurred three days previously, and it had recurred that morning. As it had been very slight, seemed to have quite ceased, and the patient stated that the movements of the child had been felt as usual, no vaginal examination was made, but the patient was instructed to remain in bed and to take food cool. Early next morning the writer was sent for because of sharp hæmorrhage; there was a second hæmorrhage before his arrival. On examination the os was found partially dilated, and projecting from the os externum was a triangular firm wedge of placenta. The pains were good, the os dilating; as there was no further hæmorrhage, progress was left to nature. About two hours later a macerated fœtus about the size of a five and half months' fœtus was born, and soon after, with almost no hæmorrhage, the secundines were discharged. The uterus contracted well. After careful examination of the secundines it was concluded that they had been completely discharged; there was no appearance of a probable site of a succenturiate portion of placenta. The further history showed this to have been an error, because on the following day a portion of placental tissue about 1½ inch in diameter came away, and at intervals a few small shreds of placental tissue were expelled, with slight increase in the amount of discharge. As the temperature was normal, except on a few occasions when it reached 99·4° in the evening, the uterus was not curetted. A hot vaginal douche was given twice daily, and four drops of tincture of nux vomica

four times a day. Mrs R. made a good recovery, although for a few days there was some anxiety because of the discharge of small portions of placental tissue. A few days after confinement albumen was entirely absent from the urine.

After careful examination the placenta was seen to consist of one mass, but not having the same consistence throughout. There was a smaller, firm, exsanguine portion—that which was felt on digital examination—and a larger portion more normal in appearance. The membranes were found to consist of a single chorion with two amniotic sacs—a larger sac, and also a smaller one—near to the os uteri, which contained a small flattened fœtus. The umbilical cord of this fœtus had a velamentous insertion; in consequence of this its vitality had been impaired, it had died and become compressed—a so-called papyraceous fœtus. The portion of placenta which belonged to this fœtus became functionless, exsanguine; it was this portion which presented, and it was because of its exsanguine character that there was much less hæmorrhage than would otherwise have taken place.

For seven weeks before confinement the amount of albumen was small—under 0·25 grm. to the litre, sometimes it was absent; nevertheless, the nutrition of the fœtus was seriously involved, and ultimately it died, another example of what has often been observed, that in albuminuria of pregnancy the nutrition of the child is seriously affected although the amount of albumen in the urine is small. Professor Davis of Philadelphia states that serum albumen in the urine is only of importance when in excess (it is presumed that he means when the quantity is large), and when accompanied by kidney debris. Both of these statements are not in accordance with the writer's experience. In cases showing only a small amount of albumen the results may be serious to the child, even if there be no evidence of organic disease of kidney.

The cause of the occurrence of albumen in the urine is in some cases difficult of explanation. In an investigation made by Professor Sir T. Grainger Stewart some years ago he found that of—

Private patients examined, 24 per cent. had albumen in the urine.

Indoor Infirmary patients examined, 49·3 per cent. had albumen in the urine.

Outdoor Infirmary patients examined, 19 per cent. had albumen in the urine.

Children in the Royal Hospital for Sick Children examined, 14 had albumen in the urine.

Patients in the Fever Hospital examined, 66 had albumen in the urine.

Patients in the Maternity Hospital examined, 72 had albumen in the urine.

Mayer, from a study at Copenhagen, found albumen in 5·4 per cent. of pregnant women, and during the last thirty days of pregnancy he found only 28·9 per cent. of all urine examined free from albumen. Premature births occurred in 8 per cent. of patients with albumen.

During pregnancy, apart from those cases which we still, because of partial ignorance, call "functional albuminuria," and those cases of albuminuria due to organic disease of kidney, and those which are due to heart disease, there are some which are caused by the pregnancy. These cases have been carefully investigated, many experiments have been made, and many theories have been advanced with the view of elucidating their etiology and pathology. As yet we only know that in them the albumen occurs not only during pregnancy, but as a consequence of it; that it occurs independently of heart or of kidney disease; that its occurrence during one pregnancy does not indicate that it will recur during succeeding pregnancies; that it is due to some condition peculiar to the pregnancy involved—possibly some unusual condition in the relation of the products of conception to the mother; that it is associated with the development of an unusual toxic condition of the blood. Although a micro-organism has been described in connection with eclampsia—a planococcus—it has not yet been proved to have a causal relation. The cause of the albuminuria of pregnancy is peculiarly prejudicial to the nutrition of the fœtus, and the severity of the result is not in proportion to the amount of albumen in the urine.

Beyond these facts we are still in ignorance of the patho-

logy of the disease, and therefore our treatment cannot yet be founded upon a secure basis.

When we have to treat such a case we have always to bear in memory that there is a possibility of grave danger ahead—danger to the mother of eclampsia, danger to the child as to its nutrition. For the development of eclampsia three conditions are requisite: (1) a certain quality of nervous system; (2) a toxic condition of the blood; (3) some peripheral irritation. In certain constitutions, especially in children, slight exciting causes produce convulsions; in others under apparently similar conditions, except that of constitution, there seems to be no tendency to convulsions.

Mrs R. is a woman of very highly nervous constitution, nevertheless, although her condition when first seen was one of considerable gravity, there was no convulsion.

Although our knowledge of the pathology of albuminuria of pregnancy is so defective, as far as our present knowledge carries us the following principles seem to be indicated:—

1. Reduce the amount of nitrogenous food.
2. Limit the production of toxic material.
3. Favour elimination.

In order to meet these indications rest in bed is important, because it places the skin in a condition favourable to excretion, it also limits the wear and tear, conserving the strength, and at the same time limiting the production of waste material. The bowels should be cleared out, and the kidneys attended to. For the latter nothing is better than water or whey. Digitalis should not be used, because in these cases we generally have a pulse of high tension; digitalis increases this and aggravates the headache. Headache, if present, may be relieved by sinapisms to the nape of neck, and sleeplessness by bromides. After a more copious flow of urine is established milk may be used, or milk and water.

Two questions of importance arise in such cases, viz.—How long should the patient be kept in bed? and how long subjected to a purely milk diet? It is a serious matter to keep any one confined to bed longer than is absolutely

be continued after the disappearance of the albumen, and even in slight cases, if not for the sake of the mother, at least for that of the infant still in utero. With regard to the cause of the albuminuria, he favoured the theory of fœtal influence, the reverse flow from the fœtus through the placenta to the mother leading to over-working of the maternal kidneys which are already functioning at high pressure. It was well known that fœtal death was followed by disappearance of the albumen.

V. ON THE CAUSE OF THE DIFFERENTIATION OF CONNECTIVE TISSUE IN THE HUMAN FŒTUS: WITH SPECIAL REFERENCE TO THE ESSENTIAL NATURE OF THE HYDATID MOLE.

By D. Berry Hart, M.D., F.R.C.P. Ed., Lecturer on Midwifery and Diseases of Women, Surgeons' Hall, Edinburgh ; Obstetric Physician, Royal Maternity and Simpson Memorial Hospital ; Senior Assistant Gynæcologist, Royal Infirmary ; Consulting Gynæcologist, Leith Hospital, &c.

When the embryologist has settled the by no means easy question of the actual moulding of an organ or tissue, he has still many difficult problems to face, and has in fact only touched the fringe of his subject. Before him lies, for instance, that interesting question of the differentiation of cells to form tissues. Why should certain of the cells of the ectodermic layer form the nervous system, while others of the same origin give rise to skin, Wolffian duct, or sweat gland? To such a question, as yet, we have no answer, although there seems to me one general fact of interest, viz., that an important and delicate tissue originating from ectoderm, say, does so early in development, while less active organs arise later, *i.e.*, further removed, in point of time, from the original dividing fertilised cell or oosperm. The nervous system originates soon, the Wolffian duct later, the sweat glands later, and so on. I could multiply instances of this, but pass on to consider the phase of differentiation of tissue concerning us at present, and the cause of it.

For some time past, in studying embryological questions,

I have been struck with some curious and apparently anomalous facts in the origin, development, differentiation, and pathological conditions of the connective tissue of the human embryo. The connective tissue of the human fœtus passes through various stages before it becomes of a fully formed type. Thus, in early embryos, 3-4 mm. in length, it consists only of round embryonic cells, which later on, say at the end of the first month, and very markedly during the second and third, form a network with spaces and a mucin-containing fluid in them. Ultimately, in the fœtus the myxomatous tissue, except in a few localities, passes on to a fully-formed areolar type with its increased fibrillation, spindle cells, and relative deficiency of mucin-containing ground substance.

I do not, of course, at present consider all the varieties of fully-formed connective tissue, but take up merely the early embryonic stage, the myxomatous stage or variety, the stage or variety represented in the villi, and the fully-formed areolar type, or ordinary connective tissue.

All these stages can be well seen in the following specimens:—The earliest stage in a 3-4 mm. human embryo; the myxomatous variety in the umbilical cord and in the pelvis, or in fact any part of the body of a two and a half months' fœtus; the stage intermediate between this and the fully-formed type in the placental villi; and the fully-formed type in the seven months' fœtus, perhaps earlier; it is still of a myxomatous type at the fourth and a half month.

I must now detail the condition of the connective tissue at these various stages.

In the *early embryo*, 3-4 *mm.*, we have corpuscles without processes, and a ground substance with some fibrillation.

In the amnion of this specimen the connective tissue is markedly myxomatous, and not quite so myxomatous in the villi and chorion.

In the umbilical cord of the two and a half months' fœtus the characteristic structure of this tissue is seen to perfection. There are branching corpuscles with a ground substance of fibres, spaces containing mucin, and a concentric arrangement round the vessels.

The connective tissue in the pelvis is of a myxomatous type,

but somewhat less marked, *i.e.*, the corpuscles are more elongated and with a much less evident triradiate arrangement of fibres.

I do not know exactly as yet when the myxomatous tissue ceases in the fœtus. I have found it at the fourth and fifth months, but not at the seventh.

The *epidermis* at the second and a half month has a triple arrangement of cells, the upper being at places dome-shaped, as Minot points out. The cord epithelium is double-layered at most parts. In the villi of the early placenta the tissue is myxomatous. At the fourth and a half month it is much more fibrous, and at the full term distinctly so.

In the adult the connective tissue is all of a fully-formed type, with the exception of the vitreous humour, where it is of a myxomatous type, mainly ground substance with few fibres or cells. In the dental pulp it is also somewhat myxomatous.

A very remarkable fact has now to be noted, viz., that in certain parts of the fully-formed fœtus and its appendages, what we have described as early stages in the development of connective tissue forms the permanent condition for that organ or site. Thus, the tissue of the umbilical cord does not advance beyond the myxomatous stage; this is the fullest development. The tissue in the core of the early villi is markedly myxomatous, but in fully-formed placentæ approximates more to the adult type of connective tissues.

What I have brought forward as to the development of the connective tissue holds good for the development of epidermis. It begins as a single layer, becomes multiple, shows stratification, and finally passes on to fully-formed skin. Each of these stages is permanent for some tissue. The single layer is permanent for the amnion, the double for the chorion, the stratified for the cord, and the fully-formed for the fœtal skin.

We have now to consider if we have any key or explanation to offer for the facts I have just summarised.

This came to me from a side issue. I happened to come across the statement in *Schäfer's Physiology*, that Sir F. Semon had suggested, in regard to myxœdema of the adult, «that removal of the thyroid produced an interference with

the full chemical development of the constituents of the connective tissues, so that these tend to take on an embryonic character" (Schäfer, in "*Schäfer's Physiology*," footnote, p. 942, and also *Brit. Med. Journal*, 1883). On looking up other authorities, I found that Bramwell discusses, in his work on "Anæmia," two views: one that the thyroid secretes a substance or substances necessary "for the healthy and satisfactory nutrition of the tissues, more especially of cerebral and nervous tissues" (*Anæmia and Diseases of the Blood-forming and Ductless Organs*, p. 297); and a second, that it separates from the tissues some poisonous substance which in atrophy of the thyroid has full sway in the body and acts poisonously. He rightly holds the first view. R. Hutchison also discusses the matter ably. It occurred to me that one might modify or adapt Semon's theory for the human embryo as follows:—In the fœtus does the thyroid secretion among other functions not favour or cause the development of connective tissue from the myxomatous to the fully-developed areolar form? I merely use this as a working theory, but it leads to some interesting and important results.

The thyroid in the fœtus develops at an early period, *i.e.*, in embryos of 5 mm., and therefore about the end of the third week. It is well developed in the fœtus, and there is no doubt as to its activity. In a section of the thyroid of a two and a half months' fœtus one can note its great vascularity and the presence of colloid, which is the active element, in the lumina of the glands. An interesting functional proof of its activity is given in the well-known Report on Myxœdema of the Clinical Society, where a case is recorded of temporary cure of myxœdema in the mother during pregnancy, while in another case improvement was also noted during pregnancy (cases 9 and 85 in the Report). I have little doubt Dr H. W. G. Mackenzie's suggestion is the right one, viz., that the improvement in the mother was due to the absorption of the fœtal thyroid secretion. [In case 9 of the Clinical Society's Report on Myxœdema the note is "Pregnancy after leaving hospital, a child, healthy, full term; marked but temporary, diminution of myxœdematous condition" (observer's name, Çavafy). In case 85 "Disease is said to have disappeared

completely on two occasions during pregnancy, and to have returned after confinement" (observer's name, Ord).]

As is well known, the secretion of the thyroid is an internal one, *i.e.*, is formed in a ductless gland, absorbed by its blood-vessels, and possibly by its lymphatics. It next enters the venous circulation, is carried through the arterial system, and distributed to the connective tissue through the lymphatics and capillaries. Blood and lymphatic circulation, *i.e.*, capillary blood-vessels, lymph spaces, and lymphatic vessels in a tissue are apparently necessary for its full thyroidisation.

Now comes an important series of anatomical facts. The cord of the fœtus where the connective tissue remains embryonic, is not vascularised either by blood or lymph vessels, and has not even lymph spaces, so far as is known. The umbilical arteries give off no capillaries in it, and thus the umbilical cord is not at any time thyroidised—it therefore remains an embryonic tissue with a covering short of fully-formed skin. It looks as if its nourishment were due to actual transmission through the substance in the cord itself. The same holds good for the amnion. On the other hand, the tissues of the villi and chorion have no lymphatics, but are vascularised, are in relation to maternal tissue, and with this as a source for thyroid we may associate their higher type of connective tissue and epithelium. In the fœtus proper we have an abundant vascular and lymphatic supply, and therefore full development of skin and connective tissue, except in the vitreous humour and dental pulp. In the vitreous we have no vessels, but lymphatics exist; while in the dental pulp, to which Dr Noël Paton directed my attention, we have blood-vessels, but no lymphatics. They thus tend to approximate more to a myxomatous type than a fully-formed one. The dental pulp, as figured by Röse, is distinctly fibrillated. I hold, therefore, that for the full thyroidisation of a tissue we require blood-vessels and lymphatics as well as a certain element of time in the fœtus—here measured by months. Connective tissues not fully developed have some modification of vessels, *i.e.*, either have no vessels or no lymphatics, although, of course, they have lymph spaces.

My view as to the effect of the thyroid on the fœtal connective tissue may now be put thus:—

(*a*) Fœtal connective tissue unprovided with vessels, lymphatics, and lymph spaces, remains permanently myxomatous, as in the case of the umbilical cord.

(*b*) Connective tissue with only a vascular supply and no lymphatics (dental pulp) falls short of the fully-formed type. The villi, it must be remembered, share in the maternal thyroid secretion as well as in the fœtal, although the latter is less perfect.

(*c*) Tissues with a lymphatic but no vascular supply also approximate to the myxomatous type (vitreous humour and cornea).

The fœtal tissues, as it were, show us the relation of the thyroid secretion to tissues with various grades of vascular and lymphatic supply. Thus we get tissues with neither lymphatic nor vascular supply; one with vascular and no lymphatic supply; and two with lymphatic but no vascular supply. In this way the fœtus experiments therapeutically with various grades of absorption of the thyroid secretion.

A striking confirmation of the feasibility of this working theory is to be found in the hydatid mole. In this comparatively common form of mole we have a marked change in the chorion, a conversion of its whole structure into a mass of muciparous tissue, which we generally describe as the myxomatous degeneration of the chorionic villi. As a rule no fœtus is to be found, although Dr Allan Sym has recorded a case of partial myxomatous degeneration of the placenta with the fœtus present, and prematurely born at the seventh month. The fœtus was not specially examined, and the whole specimen was unfortunately accidentally destroyed some time afterwards. I think, however, that valuable information will be got from the careful examination of the thyroid of such specimens. The point as to whether a twin was not present should be considered.

The nature of the hydatid mole is quite unknown; but based on what I have already suggested, it seems to me most likely to be an acute myxœdema of the chorion, the fœtus having ceased to develop at a very early period and prior to

the development of the thyroid. Myxœdema in the adult exists usually in a chronic form; but probably Dr Ord's case, where the mucin was estimated by Dr Charles, was an acute form, and thus an excessive quantity of mucin was found in the subcutaneous and other tissues.

In the hydatid mole, analysis has shown an increase in mucin, but fresh work on this point will be necessary as specimens come to hand. I urge, therefore, and repeat this view of the hydatid mole as a probable one. There is non-development of the fœtus before the thyroid forms, *i.e.*, prior to the third week. The chorion itself lives and continues developing its myxomatous elements, mainly villous. The villi normally have a myxomatous core up to beyond the second month and probably into the third, and as a rule this is the time for such moles to develop. Too little attention, however, has been paid to the core of the villi, and almost all controversy has raged over their epithelial covering. It will be important to trace more exactly at what age of the placenta the myxomatous core begins to become more fibrous. I may note here that the villi in the moles I have examined do not contain any fœtal vessels as in the normal villi. If a hydatid mole be myxœdema of the chorion, it is an acute and not a chronic form, and the reverse of the adult as to frequency.

I have, however, recorded a case of fibrous mole, *i.e.*, of a hydatid mole retained for nine months, and in this the myxomatous villi had become more fibrous. There was probably, during the retention, thyroidisation from the maternal side, and thus a higher stage than myxomatous tissue obtained. This case would correspond more nearly to the adult myxœdema.

It might be urged against this view of the hydatid mole that a mother with myxœdema should, when conception takes place, have a hydatid mole. The fœtus in myxœdematous mothers has, however, its thyroid, and develops normally.

In regard to sporadic cretins, it is to be noticed that in most cases the cretinism develops after birth; in the fœtus the thyroid is present.

Congenital cretins may have had thyroid disease late in fœtal life. For the production of the hydatid mole my view

requires non-development of the embryo, or absence of its thyroid at the third to fourth week.

The question may now be asked, if the view advanced has any therapeutical bearing? There are evident reasons against the probability of one's preventing hydatid mole by administering thyroid extract, as diagnosis early enough is impossible. I think, however, that thyroid extract should be given after hydatid mole abortion. The question arises as to the relation of the thyroid to deciduoma malignum which follows, with some frequency, hydatid mole. In no case of deciduoma malignum have I been able to find any note as to the condition of the thyroid; but it seems to me that in future in such cases the condition of this gland should be investigated.

Before summing up my conclusions on this matter, I may point out that the connection between defective thyroid action and adult myxœdema is absolutely proved by pathological, therapeutic, and experimental evidence.

In the case of the fœtus and the hydatid mole the evidence of thyroid action and of defective thyroid action is not as yet so complete, and although I have endeavoured not to overstrain it, I wish to put forward my opinions with this reservation.

I may now sum up as follows:—

1. There is anatomical and clinical, but not as yet any experimental, evidence that the thyroid is functionally active in the embryo.

2. The thyroid begins to develop in fœtus of 5 mm., *i.e.*, about the twenty-first day, and is well developed as the fœtus grows.

3. It probably causes the development of connective tissue when both lymphatics and blood-vessels are present, to pass from the myxomatous to a higher stage, the areolar. Thus:—

(1) The cord, without vessels and lymphatics, and presumably without thyroidisation, remains myxomatous.

(2) The adult vitreous, with only lymphatics, remains more allied to myxomatous tissue than any higher form; the same holds good for the dental pulp which is provided with blood-vessels only.

(3) Tissues like the villi are more or less myxomatous

according to their age and length of exposure to vascularisation.

4. The free covering of somatopleure, *i.e.*, skin, cord, amnion, chorion, is also probably affected by the thyroid.

5. The hydatid mole may be regarded as acute myxœdema of the chorion.

6. Thyroid extract should be administered after hydatid mole abortion, to favour the passage of any myxomatous villi left, to a fibrous state.

The relation of the thyroid to cases of deciduoma malignum has yet to be investigated.

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Professor Simpson said he had himself known patients in whom there was a recurrence of vesicular mole in at least two successive pregnancies, and there were many such cases on record. At the same time he had understood Dr Hart to

suggest the administration of thyroid extract, not as a prophylactic against the possible recurrence of myxomatous degeneration in after pregnancies, but rather as a preventive of the possible development of the so-called deciduoma or chorioma malignum. He (Professor Simpson) was not disposed to admit the desirability of the use of this drug as a routine measure in the after-treatment of cases of vesicular mole, because on the one hand the administration of thyroid required to be carried out with caution, and on the other it was very rarely that the malignant degeneration in the uterus was observed. It would be well, however, in any case where symptoms of malignant disease of the uterus showed themselves subsequently to vesicular mole, to bear in mind Dr Hart's brilliant and original observation, and have recourse, among other measures, to the exhibition of thyroid.

Dr J. W. Ballantyne was of the opinion that Dr Hart's communication contained much that was original, and that his conclusion regarding the nature of the hydatid mole was based upon a series of facts, but disconnected facts. It was to be borne in mind that the argument, that the formation of a mole was due to defective development of the thyroid, could scarcely apply, for in hydatid moles it was not a case of absence of the thyroid or disease of it, but of absence of the whole embryo. He thought the absence of vascularity a much more important factor in preventing the development of the mucoid into ordinary connective tissue. There were several cases on record in which the same patient had given birth to more than one hydatid mole. Depaul spoke of it having occurred thrice, and he believed that Mayer held the record with a case of eleven pregnancies, all ending in the expulsion of hydatid moles. As regarded the tendency of the mole to give rise to deciduoma malignum, the observations of Polano (*Ztschr. f. Geburtsh. u. Gynak.*, XLI., 54, 1899) were of considerable interest; he found from uterine scrapings and from post-mortem observation, that about eight days after the occurrence of abortion and of the expulsion of hydatid moles, microscopic examination showed no trace in the uterine wall of either decidual cells or fragments of fœtal tissue.

MEETING IV.—FEBRUARY 14, 1900.

DR J. W. BALLANTYNE, *Vice-President, in the Chair.*

I. *Professor Simpson* showed (*a*) TWO FIBROID UTERI removed by pan-hysterectomy; (*b*) SPECIMEN OF HYDATID MOLE; (*c*) a BOTTLE OF LEVURINE; (*d*) an IMPROVED BASILYST; (*e*) HEAD OF CHILD delivered by Basilysis.

II. *Dr Keppie Paterson* showed a SPECIMEN OF MYXOMATOUS OVUM.

III. *Dr J. W. Ballantyne* showed (*a*) a FŒTUS with absence of radii and deformity of thumbs. It was a female, and was the result of the eighth pregnancy of a monstripara with a family history of defective development of the muscles of the thumbs. She had previously given birth to a hydrocephalic, and then to an anencephalic foetus, both female; these he had shown to the Society some years ago (vide *Transactions*, XVIII., 148; XX., 89). In the present instance the infant was born alive and lived for three days; the right thumb was absent, the left was rudimentary and attached by a narrow neck of skin, and both radii were absent; there was a battledore placenta. The first and second pregnancies had ended in the birth of male infants, normal and now living; the third in an abortion; the fourth in the anad hydrocephalic foetus; the fifth in a normal living girl; the sixth in the anencephalic foetus; and the seventh in a normal female infant who died in six weeks. The patient was under the care of his friend Dr R. A. Lundie, to whom he was indebted for the specimen. (*b*) An ANENCEPHALIC FOETUS, a male, weighing three pounds, and measuring 36·5 cms. in length, which had been sent to him by Dr Macgregor of Jedburgh. It was the illegitimate child of an anæmic girl, 22 years of age, with a family history of phthisis and hysteria. The labour, which was a fortnight before the full term, was very easy, the patient scarcely recognising that they were labour pains from which she was suffering. The foetus was typically

anencephalic. The puerperium was normal. (*c*) PHOTOGRAPHS OF HISTORICAL TERATOLOGICAL PHENOMENA, including the armless man, Thomas Schweicker; the man Batista, with his parasitic twin brother; and the "Wunder-Kinder" of Zirndorff.

IV. A CASE OF PUERPERAL ECLAMPSIA, HAVING A PECULIAR PUERPERAL HISTORY: AND OBSERVATIONS ON COMA AND ITS TREATMENT BY VENESECTION.

By DR S. MACVIE, Chirnside.

THE following case is interesting in more than one aspect, but it is as a case of eclampsia that it is brought before the Society. As such it presents no exceptional features, nor does it cover the whole subject. But it affords an interesting thread of narrative on which to string a few beads of commentary on the comatose state and its treatment by venesection.

Mrs B., iv.-para, æt. 35 years, was under average in muscular development and vigour, and of a neurotic temperament. Her nervous disposition reflected her asthenic constitution, and was manifested under, or in anticipation of, emotional stress in helplessness, timidity, and dread. She came under my care at her second confinement with a history of an easy first labour and a slow recovery. The cause of the prolonged puerperium was not ascertained.

When confined, the labour was normal and easy. Chloroform was administered at her urgent entreaty towards the end. The case promised to be uneventful, and my attendance had ceased. At the end of the first week I was again called in, and found her seriously ill.

She lay in a partial stupor, paying no attention to any one unless loudly spoken to or disturbed. She took food when it was offered, nursed the child when it was put to the breast, answered questions rather confusedly, and recognised those about her. The stupor gradually deepened during the next few days. The pulse was rather slow and soft, the breathing

quiet and shallow with intermittent sighs, and the temperature was normal. The bowels responded fairly well to drugs administered both by the mouth and rectum; the urine was rather scant, deposited urates, but was otherwise normal. The child was taken from the breast, and the treatment was mainly nutritive and designed to keep the heart going. When death seemed imminent signs of returning consciousness appeared, and by the end of another week the patient was in all respects, except debility, better. She slowly regained strength. Her health up to her next confinement did not call for medical treatment. Again the labour was of the same favourable type, and was conducted in the same way, but her condition was watched by myself from day to day. Progress was quite normal until the seventh day, when she became listless and apathetic, lost interest in what was passing around her, and lay almost constantly on her back, looking straight out, but evidently noticing nothing. The child was at once taken from her, and the secretion of milk checked as the pulse showed signs of low tension. The symptoms of the previous puerperium were repeated, but the stupor did not become so profound and the rally was earlier.

The pregnancy with which this paper specially deals was disturbed at the end of the sixth and the beginning of the seventh month by gastric irritation, which was easily subdued. At that time there was no sign of œdema of the lower extremities, and the urine was not examined. From that time I did not attend her until sent for on the morning of the 17th June last year. I had decided that she should not nurse the child, that chloroform should be administered early, and to such a degree of narcosis as would leave no remembrance of the further course of labour, with the object of removing or lessening her dread of pain, and of obviating the depression produced by dwelling upon past suffering; and that the labour should be terminated as rapidly as possible, in the hope that a short labour and a quick recovery of strength might carry her through the dangerous second week. On entering the room I was assailed with piteous entreaties for chloroform. Her insistence showed a mental anguish wholly incommensurate with the force of the pains. On examination the maternal parts

were found normal, secretions abundant, the rectum empty, the os half dilated, soft and dilatable, the membranes unruptured, the liquor amnii greatly in excess, and a face presentation right mento-posterior. I also observed, while making some preliminary arrangements, that the ankles were somewhat swollen and pitted on pressure. This unexpected feature cast doubts upon the wisdom of the premeditated active interference. Œdematous extremities and a neurotic patient are an undesirable combination. Besides, in multiparæ, a face presentation may be safely left to nature. But on the other hand, as the labour, if left alone, would thus be protracted, the exhaustion would be greater, and the possible repetition of previous experiences, under conditions of greater debility, was not a pleasant contemplation. The general rule, in view of a probable eclamptic complication, is to interfere as little as possible, a salutary recognition of the peripheral starting-point of convulsions. But as the labour was to be conducted under fairly deep anæsthesia, the chance of peripheral irritation exciting central motor impulses was *à priori* unlikely.

In the series of cases brought before this Society earlier in the same week by Dr Jardine, almost every conceivable manipulation and operation had been performed about and upon the uterus, while the patient was either under chloroform or morphia, or chloral, or chloral and bromide of potassium combined, or in a more or less profound comatose state, without a convulsion having occurred. Yet in that same series a convulsion is recorded as occurring as the child was entering the world and before skilled assistance had arrived; another while a catheter was being introduced, presumably without an anæsthetic; and still another when an enema began to act. Both on *à priori* and experimental grounds a departure from the general rule for the sake of an ulterior salutary object was considered warranted. It may be added that while face cases in multiparæ may be safely let alone, the mento-posterior variety require attention lest the forward rotation of the chin did not take place, and this necessitates some interference. Chloroform having been administered, an attempt was made to convert the "face" into a "vertex" presentation. The motility of the fœtus in the hydramniotic condition suggested

this as an easy operation. But when the chin was pushed upwards, the extension of the neck continued, and the forehead went upwards also. On endeavouring with two fingers to pull down the vertex, the chin, pressed backwards, apparently caught on the posterior pelvic margin. Probably too little pressure was used lest the membranes should give way. Without persisting in the attempt, the forehead was pushed round to the left and a mento-anterior position secured. The extreme dilatability of the os was so apparent that the obstruction to the passage of the head evidently was not due to the undilated condition of the lower uterine segment. The membranes were therefore ruptured, and soon the face was engaged in the roomy inlet. Forceps was soon thereafter applied, and delivery effected in a comparatively short time. The child was not disfigured by a caput succedaneum. The placenta was removed in ordinary course, the uterus contracted well, and the hæmorrhage was comparatively slight. The patient was allowed to awake undisturbed.

At 10 A.M., when I left, she had taken liquid nourishment, and received instructions as to securing quietness, and, if possible, sleep. She continued well until 4 P.M. She then complained of feeling "queer in the head," of having "a dizzy feeling," and of "sounding" in her ears. A convulsion immediately followed. One fit followed another until eight or ten had occurred (one of the neighbour women who waited on her said eight, the other said ten), and when I arrived a little before six o'clock she was lying unconscious, with flushed face, breathing laboured and stertorous, pupils slightly dilated, and pulse small, hard, and rapid. She had never shown signs of consciousness after the first fit.

The treatment of eclampsia is mainly determined by the *status præsens*. When a state of coma has continued for nearly an hour after the last fit and is marked by stertorous breathing, the danger is less from a recurrence of the fits than from a deepening coma. A recurrence of the fit would indicate a returning responsiveness of the nerve centres, or a more intense morbid stimulus. The latter is less probable nine hours after labour. Therefore treatment by nerve sedatives,

narcotics, and anæsthetics are for the moment out of court, and only unmistakable warnings of the recurrence of a convulsion would justify their administration. Morphia or chloral could not more effectually lull the centres, and chloroform could not be safely pushed further than stertorous breathing.

The treatment adopted was at first topical, and was designed to remove possible sources of local irritation, to soothe the sensory periphery, and to promote the normal secretions. The uterus was douched with weak lukewarm perchloride solution, and some tar-coloured blood and small clots removed. The rectum was first washed out and then refilled with normal saline solution to promote mucous secretion and uterine discharge, and to the extent of its absorption to dilute the blood. About four ounces of urine were withdrawn from the bladder, which, on being boiled, gave nearly a one-half deposit of albumen. There is a case on record where the convulsions ceased at once after an over-distended bladder had been emptied. Hot fomentations were applied to the abdomen and thighs, a hot bath being an impossibility. The benefit of these measures was not apparent.

At such a juncture one naturally thinks of those general eliminative measures summed up in the maxim, "Put the emunctories in action." Yet one wishes at the same time to have a more definite objective for treatment; a proximate cause of the cessation of the fit, for example, or of the comatose state, as a sort of bull's eye at which to take aim instead of blazing away at the whole target. Without attempting a detailed analysis of a convulsion, it may be said that on a first view it seems inconsistent to assume that the cause of the onset of a fit is also the cause of its cessation. A more congruent assumption would be that new conditions have arisen during the fit which have modified the excito-motor potency of the morbid stimulus. The symptomatic sequence of a convulsion implies a causative sequence. Action implies reaction. New forces created or liberated by the abnormal functional activity of brain and muscle may have assumed causative rôles antagonistic to the convulsive state, and while it may be unfavourably influencing the comatose state.

Could such a proximate cause of the cessation of the fit or of the comatose state be isolated, as it were, and attacked separately, the treatment of a case would be carried on more confidently and more successfully. The significance of a proximate cause is that it is the last straw which breaks the camel's back. Each other straw in that bale of exciting causes is doing its weighty best to make manifest the pre-disposing weakness of that vertebral column, but unavailingly. To overcome the proximate cause is to save the situation. Assuming for the sake of illustration merely that some peripheral irritation, such as a uterine contraction causing some distension of the lower uterine segment and internal os, is the starting-point of the giddiness—the eclamptic vertigo—felt by the patient, what are the physiological or pathological factors which change that subjective impression to unconsciousness, the unconsciousness to muscular paralysis; this in turn to tonic spasm; the latter to clonic spasm; and, lastly, arrest all spasm and leave a condition of excessive muscular prostration, profound coma, flushed countenance, and laboured and stertorous breathing. It will doubtless be said that a sudden and rapidly increasing cerebral anæmia accounts for the entire sequence, the pathological difference being one of degree and not of kind. Is there no other? I wish to direct attention to what happens during actual fit. During the tonic spasm, which may last thirty seconds, there is complete asphyxia. During the clonic spasm there is a dyspnœa as near as possible approaching to asphyxia. For the respiratory rhythm does not and cannot time itself to the rapid inco-ordinate muscular contractions of the clonic stage. The clonic spasm lasts on an average two minutes (Trousseau.) This serious interference with respiration lasts two and a half minutes on an average. Unfortunately I am unable to say that this was actually the duration of the fits in this particular case. But there is the fact of at least eight fits occurring in about an hour, and the point of the observation is that during a third or thereby of the hour during which the fits occurred the patient was in a more or less asphyxial condition. One can hardly conceive that a patient who has undergone the exhausting ordeal of labour would not suffer somewhat from this, and

would not exhibit signs of venous congestion and its effect upon the circulation and the nerve centres. Moreover, the partial suffocation of the spasmodic stage is more severe than any ordinary obstruction to the respiration. During the spasm the thorax and abdomen are unyielding cavities. The inflowing blood, driven by muscular contraction from the convulsed extremities, finds no distensible cavity into which it can pour. There is no room for it except what is afforded by the compressibility of the gases in the thorax and abdomen, and by the distension of the superficial veins. The pressure of blood in the veins must therefore be excessive to an unusual degree. Such a pressure in front obstructs the blood passing through the capillaries, increases arterial tension. Hence the pulse, which prior to the fit was normal, is, after the fit, small, hard, and rapid. The blood also becomes surcharged with carbonic acid. One would naturally expect that a lessened blood-supply, containing an excess of carbonic acid, would appreciably affect the nerve centres. In the first place the excito-motor nerve elements are exhausted by their hyperactivity; secondly, they are starved owing to the lessened arterial supply; and thirdly, they are poisoned with carbonic acid. It may be recalled that the toxic effects of carbonic acid are increased by an accompanying deprivation of oxygen, and that they are identical with the drowsiness, stupor, and coma of the post-convulsive stage. If these effects of one fit are multiplied by the number of fits occurring in an hour their gravity is better understood. But when it is recalled that these effects occur in a patient previously rendered unconscious, that each fit attacks a victim more prostrated, and that the interval between the fits does not permit the starting-point of the first fit to be regained, to multiply the effect of one by the square of the total would seem more accurate. The question may be asked, Assuming that no pathological condition save the interference with respiration, what would be the state of the patient as regards (*a*) the circulation, and (*b*) consciousness half-an-hour after the last fit? Would she be conscious, and would the pulse-rate and tension be normal? Or, to put it another way, if a patient with such a history is found with flushed face, laboured and stertorous breathing, and deeply unconscious, what proportion of those

symptoms might be set down to the asphyxial condition, and what to some other toxæmic cause ?

The treatment to be adopted would be determined by the answer both as regards the choice of remedies and the order of their employment. If the answer that the symptoms resulted solely from a toxæmia due to renal lesions and uterine conditions, the arterial contraction would precede the venous congestion and stand in causative relation to it. The venous congestion would be a passive condition, and might be disregarded as a morbid influence. But if the symptoms enumerated should be interpreted as even partly due to the respiratory arrest, then the venous congestion would precede a certain degree of the arterial contraction and stand in a causative relationship to it. One indication for treatment would be the removal of the excess of carbonic acid and the relief of the venous congestion. It is for this purpose that oxygen inhalation finds both its warrant and the measure of its benefit. Failing the employment of oxygen, the relief of the venous congestion and the removal of the excess of carbonic acid can best be effected by venesection.

In relieving blood-pressure it is not enough to deplete the vessels. If a morbid irritant is causing arterial contraction, the relief gained by blood-letting would be short-lived. If it is due to forcible action of the heart, a rational treatment would be found among cardiac depressures. Indirect depletion, by acting on the bowels, skin, and kidneys, might lessen the volume but fail to restore the venous and arterial equilibrium. But venesection goes, in this instance, direct to where the pressure exists,—it is simple, safe, and effective. It does not negative any other method, but it may be said that it is better to bleed first and purge afterwards, than the reverse. Besides, a mechanical remedy has a certainty not possessed by any remedy which depends for its effect upon a vital reaction. In abnormal conditions of the nervous system, an unfailing response is not to be reckoned upon.

Dr Jardine cited in his paper a case where five drops of croton oil failed to act on the bowels, another where veratrum viride failed to slow the pulse, and other similar examples. At times also the action of drugs is accompanied by un-

desirable collateral effects. Dr Jardine was glad that in one case he had not used veratrum viride because he feared its depressant effect would have been fatal, and I have seen pilocarpine produce alarming collapse. Except when administered hypodermically, the response to drugs is slow, and in eclampsia time is—life. Venesection has no such disqualifications. It also performs vicariously a normal function by taking the place of the normal post-partum hæmorrhage, which in eclampsia is always very scant. After venesection the lesser amount of blood passing through the lungs will be more oxygenated—the respiratory rate and depth remaining the same. In twelve or twenty-four hours the eliminative action of the kidneys will return and the patient's condition greatly improve: venesection anticipates this period. One disqualification must, however, be stated. The venous congestion and the amount of carbonic acid can only be lessened to the extent that it has been caused by the respiratory arrest. The vessels will contract upon the diminished volume, and the percentage of toxic material due to other causes will remain the same.

To lessen this percentage becomes in turn the indication for the moment. Whether this is best accomplished by acting on the main excretory organs and making up for the amount of fluid excreted by nutritive diluents, or by directly diluting the blood by the injection of normal saline solution alone or combined with a diuretic, is a question which would be largely determined by the means at hand, and the desire for a rapid effect. It might even appear that the reduction of the absolute amount of toxic material in the system by blood-letting is a valuable preliminary to the injection of normal saline solution. Assuming that a certain concentration of toxic material in the blood is the cause of the convulsive seizure, the abstraction of blood for the purpose of lessening the *absolute* amount, and the introduction of saline solution in order to reduce the *relative* amount is a double-barrelled procedure plausible enough. Blood-letting may thus play a dual rôle in eclampsia. What is here mainly insisted upon, however, is that there is a degree of coma, in some cases due to the presence of a large excess of carbonic acid in the blood.

Those cases are marked by rapidly recurring convulsions, and the coma is characterised by flushed countenance, laboured and stertorous breathing, and small, hard, and rapid pulse. The significance of stertorous breathing lies in the fact that it is a degree of obstructed breathing. Stertorous breathing means that the excess of carbonic acid and the venous congestion are being maintained to some extent. Granting that other causes of auto-intoxication are operative at the same time, the presence of an excess of carbonic comes in as "the last straw." It is an accidental complication of the case, so to speak, as she died from a renal or cerebral point of view. It stands to the convulsive seizure as the hæmorrhage of typhoid fever stands to the bacillus typhosus. There is no *necessary* connection. But as such it calls for differential diagnosis and special treatment. And though the treatment adopted is only what has been for other reasons sanctioned by experience at one time and discarded at another, there is a satisfaction in proceeding upon a rational instead of an empirical basis.

Acting upon the reasoning given above, the median cephalic vein was opened.

The median cephalic vein was opened and a coffee cupful of blood withdrawn. This would amount to nine ounces. It is not advisable to bleed largely at once. The exact amount of blood depletion necessary to relieve the venous pressure can only be surmised. If too little blood has been withdrawn the operation can be repeated. The venesection wound was dressed with a compress soaked in corrosive sublimate solution —one to a thousand. Without forgetting the destruction between *post hoc* and *propter hoc*, I may mention that just as I had finished bandaging the arm, one of the women assisting me remarked that the patient was breathing quickly, and I noticed that the stertor had ceased. This indicated that the coma was less profound, and since stertorous breathing is a degree of obstructed breathing, it indicated a freer passage of air into the lungs with all the benefits resulting therefrom. It was then found that the deglutition reflex was active, and spoonful by spoonful three coffee cupfuls of warm water were administered by pulling out the cheek and allowing it to trickle

round the root of the tongue. Not having the apparatus prevented me from using saline solution subcutaneously. The difference between the methods is not only one of time, but also of convenience to the patient. A pint of saline solution may be introduced under the skin in four minutes, and disappear in twenty (Jardine). How long the same quantity would take to pass from the rectum and stomach combined in the case of a patient who had had no food all the previous night, and only a cupful of tea and a similar quantity of bread and water between 10 A.M. and 4 P.M., I am unable to say. Besides, where swallowing was difficult and the fluid by entering the larynx interfered with the breathing, or where swallowing was impossible, the subcutaneous method is not only the best, but the only possible one.

An early return from profound coma to a lesser degree does not, however, negative the subsequent convulsions. Neither does it negative the benefit of the treatment. A patient whose reflex excitability permits or enables a fit to occur, is in a safer condition than when coma precluded such a possibility of the convulsions. The treatment of a recurrence would be the same as the treatment of a first convulsion. Chloroform anæsthesia is as effective in preventing a convulsion as the most profound coma. Clinically, there is no difference between chloroform anæsthesia and eclamptic coma. Both have the same power over the excito-motor centres—they can both kill. But there is this difference, chloroform anæsthesia can be stopped in about ten minutes, eclamptic coma perhaps not at all.

Continuing the narrative of the case: at 10 o'clock, on renewing the fomentations, the patient appeared restless. When next renewed she moved her hand and attempted to put them away, showing that heat sensibility had returned. At intervals the rectum was refilled and a coffee-cupful of warm water administered with a spoon. The breathing continued natural, the pulse-rate lessened, and the calibre of the artery increased. I left her from 1 A.M. till 5, and on returning she answered "No" twice to my questions. At 8 o'clock she recognised those around her, and spoke sensibly.

Steady progress towards recovery was made during the following days. The treatment was wholly dietetic, and consisted substantially of milk. The child was not put to the breast, and the milk secretion, which was scant on the third day, soon ceased. On Wednesday the urine was copious and showed only a trace of albumen. The uterus was well contracted, the bowels active, and the temperature normal. On Thursday two incidents, trifling enough in themselves, may be mentioned in connection with the history of the next few days. The patient's mother fainted from some trifling cause—probably flatulent dyspepsia—and the patient was greatly alarmed. The same afternoon a former neighbour came to visit her, who, rushing forward to the bed, exclaimed hysterically she had never expected to find the patient alive; there was an emotional scene. On Friday progress was favourable, and the patient began to talk of getting out of bed. Towards evening she became somewhat apathetic. This was more pronounced on Saturday, although she took her food well. On Sunday she gradually lapsed into stupor, which became deeper and deeper. On Monday, the tenth day, the heart showed signs of failing and the breathing altered in character, the inspiration being deep, the expiration short, and a prolonged pause. Death took place the same evening. The temperature began to rise on Monday, and a short time before death was 103°. A discussion of the proximate cause of death does not fall within the scope of this paper. That the eclampsia was cured I do not doubt; that the lowered vitality induced by it acted unfavourably on a cerebral lesion, which had complicated three and probably all four pregnancies, is all the more regrettable, since, singly, they were not invincible.

Dr J. W. Ballantyne thought that Dr Macvie had treated the subject under discussion with all thoroughness and with almost inquisitive research combined with logical exactness and philosophical method. There was much that was suggestive in the communication. The use of venesection in cases of eclampsia was not, of course, novel, but the limitation of it to certain kinds of cases was new to him at least, and it seemed

to him that Dr Macvie had made out a good reason for so limiting it.

Professor Simpson agreed with the President in regarding Dr Macvie's paper as one of much interest and value. The record of the case would have been more satisfactory if it had been possible to make a post-mortem examination of the patient; because in some of these eclamptic cases, apart from congestions and anæmias of the brain, there were sometimes more definite brain lesions, and some points in this history gave rise to the suspicion that the patient may have had brain disease. Dr Macvie's account of the good effect of blood-letting, and his original suggestions as to the *modus operandi* of this measure, were extremely interesting and worthy of further consideration.

Dr Haultain was greatly interested in Dr Macvie's observations on the cause of the coma being due to carbonic acid poisoning, and thought that the oxygen inhalation was a valuable suggestion in the lines of treatment. Excess of carbonic acid in the blood must be favoured by the presence of pulmonary œdema, which was almost a constant accompaniment in severe cases of eclampsia. He would like to add that he (Dr H.) had seen in consultation lately a case of rapidly progressive coma similar to that described by Dr Macvie. The patient died on the third day of the puerperium. There was no albuminuria, convulsions, or œdema. Unfortunately a post-mortem was denied.

Dr Barbour thought the suggestion as to the use of oxygen well worthy of trial. Bleeding was not always beneficial, though, undoubtedly, it did good in some cases. He had tried it only in two cases, but without any benefit. Until we understand the pathology of eclampsia our treatment must be, to use Dr Macvie's happy illustration, blazing at a target without seeing the bull's eye.

V. DELIVERY BY BASILYSIS.

By A. R. Simpson, M.D., F.R.C.P.Ed., Professor of Midwifery in the University of Edinburgh.

Improvements in the construction of the forceps and a better appreciation of the conditions under which turning, Cæsarean section, and symphysiotomy can be safely carried out, have in

recent years greatly restricted the group of cases in which the obstetrician feels called upon to deliver by cephalic embryotomy. Some have even proposed to relegate the whole store of perforators, comminutors, and extractors of the head to the presses of antiquarian museums. That there is still, however, a not inconsiderable field for the employment of embryotomy procedures, may be gathered from the circumstance that at least six of the numbers of last year's *Centralblatt für Gynækologie*, Vol. XXIII.,

Fig. 1.

contain one or more papers on the subject. If the cases are rare, there is all the more need that the practitioner have in his hands the implements with which he may most simply and safely bring about the head-reduction and delivery.

In 1880 I read a communication to this Society, in which I proposed the use of the basilyst for first perforating the cranial vault, and afterwards perforating and dissolving the cranial

base. In 1882, and again in 1883, I related cases illustrative of the value of the operation, and showed a head that had been delivered by basilysis (see Fig. 1). I explained further that, to fit the instrument to act as an extractor as well as a perforator and comminutor, I had added a traction blade to be applied outside the head, like the external blade of a cranioclast. Abundant evidence had been adduced from many quarters in proof of the superiority of the cranioclast to the cephalotribe

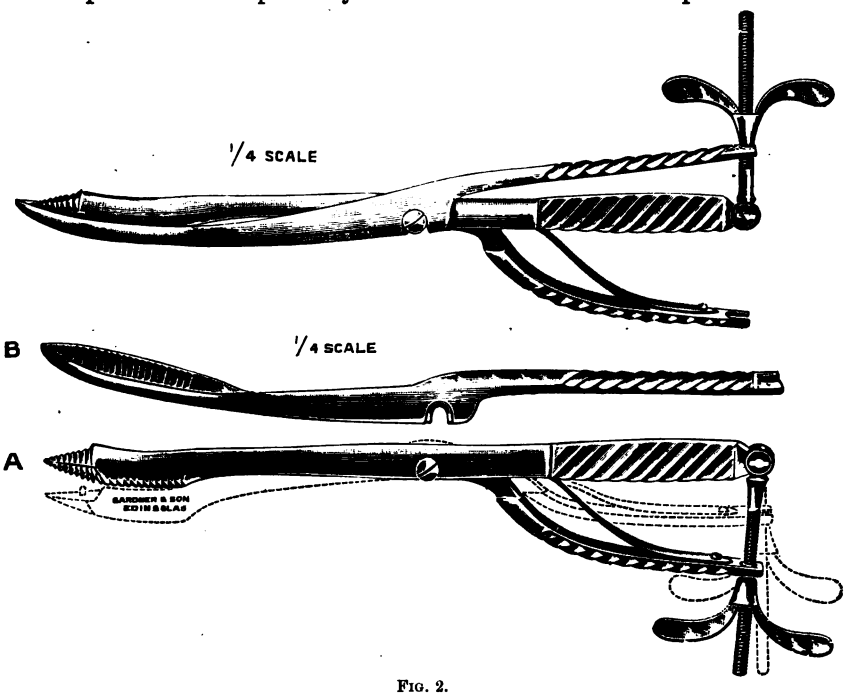


FIG. 2.

as an extractor. The chief drawback to the cranioclast is that in some cases it does not fracture enough of the base of the skull to allow of the perfectly easy extraction of the head. It was to supplement this deficiency that I proposed the basilyst, with the further idea that in many cases such dissolution of the basic structures would be produced as to allow of the expulsion of the head by the natural efforts.

Since that time various suggestions have been made for the improvement of the cranioclast, such as that of Dr Hubert

Peters (*Centralblatt für Gynækologie*, XXIII., 472, 1899), who would have the internal blade furnished with a point that should allow of its being screwed into the foramen magnum, or some part of the base, so as to get a more secure hold for traction, as well as to allow of fuller crushing of the base than can be accomplished with the ordinary cranioclast. A still greater number of three-bladed contrivances have been proposed, which should have the object of adding to the cranioclast the power of the cephalotribe for compression of the head. These are exemplified in Auvard's Embryotome Cephalique Combinée (*Arch. de Tocologie*, XVI., 1889), Zweifel's Kranio-Cephaloclast (*Centralblatt für Gynækologie*, XXI., 482, 1899), Fehling's Kephalo-thrypt-helktor (*Centralblatt für Gynækologie*, XXII., 1177, 1898). That which has been most approved is the basiotribe of Professor Tarnier, which he produced in 1883, and the value of which has been demonstrated in the essay of M. Bonnaire (*Sur le Broiement de la Tête Fœtale*, Paris, 1885), or more fully and with numerous illustrations in the work (*De l'Embryotomie Cephalique*, Paris, 1889) of M. Paul Bar, one of the ablest of the brilliant group who loved and looked up to the great Parisian obstetrician as their "Maître." The basiotribe consists of three parts—(1) a straight perforator that is to pass through the vault and on to the base; (2) a first blade to be applied outside the head and jointed to the perforator, so as to make of it a modified cranioclast; (3) a second blade that is to be applied when necessary to the side of the head opposed to that which was caught by the first, so as to make of the instrument a modified cephalotribe. The record of cases of basiotripsy shows that in the hands of Tarnier and his successors excellent results have been obtained by the use of his instrument. But I cannot get rid of the conviction that the first effort of the obstetrician should be to break up the base from within, and not from the outside. The application of the external blade is not always very easy. It often implies the previous introducing of the hand into the genital cavity, with danger of laceration of the uterus and access of septic germs. All this is increased when two blades have to be carried into the uterine cavity outside the fœtal head. And although the basiotribe is an effective comminutor, the flatten-

ing of the head between two blades cannot admit of the elongation and adaptation of the head to the configuration of the canals, which is such a favourable feature in the extractions effected by the cranioclast. Moreover, I am more and more convinced that in many cases the basis cranii can be so simply and safely and effectively dissolved from within the skull as to render quite unnecessary the application of even one external blade. As an illustration, let me give you the history of a patient who was recently delivered by basilysis in the Maternity Hospital. I show you the head of the infant, after it has been hardened in formaline and cut in the coronal direction from above downwards. The base has been perforated in its anterior portion, and has been so fractured and softened that between the points of the calipers in front of the ears it measured 1½ inches in width (see Fig. 3).

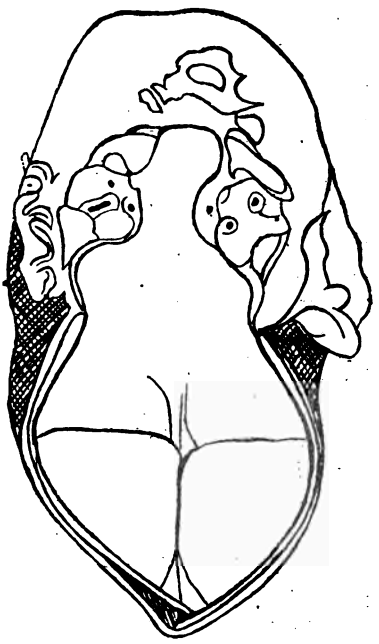


FIG. 8.

E. F., æt. 18, stunted and dwarf-like in her appearance, was admitted into the Maternity Hospital in the ninth month of her first pregnancy, on the 2nd January 1900. Patient was 4 ft. 4 in. in height, and was the subject of well-marked right dorsal scoliosis and left lumbar scoliosis. The right leg measured, from the anterior superior iliac spine to the external malleolus, 26½ inches. The left measured, between corresponding points, 25¼ inches. The right thigh was 13¼ inches in length; the left, 11¾ inches. There was marked tilting of the pelvis, the left side being highest. There was no evidence of any previous hip-joint disease. Patient was sent into hospital because a

serious difficulty was expected at the impending labour owing to the pelvic deformity.

Her mother stated that patient was unable to walk till she was five years old, but says that up to her thirteenth year she noticed nothing definitely wrong in her configuration. At the age of thirteen she took scarlet fever, and it was after she came out of hospital that, for the first time, it was noticed that the back was "crooked." Since this illness patient had not grown in height, and the spinal deformities had gradually become more marked. Patient's general health has been good.

Physical examination. — Breasts well developed; gland tissue abundant, with plentiful secretion; nipples prominent; areolæ well marked.

Abdomen.—Protuberant; abdominal swelling corresponding in size to periods of amenorrhœa passed. (Patient had menstruated last in April 1899, and stirrage was first felt in August). The swelling lies somewhat obliquely with long axis from the right hypochondrium to the left iliac region. Abdominal walls lax, linea nigra and striæ gravidarum well marked. The uterus is directed obliquely downwards from right to left, with the fundus at the lower border of the ensiform cartilage. Fœtal head felt low down above the brim. Limbs on the right side. Uterine bruit and fœtal heart-sounds both audible.

Vaginal examination.—Sacral promontory is abnormally prominent and somewhat deviated to the right side. Cervix is high up and to left side of promontory. Fœtal head felt presenting above the pelvic brim, freely movable.

Pelvic measurements.—Intercristal diameter, 10¾ in.; interspinous diameter, 10 in.; external conjugate, 6⅞ in.; diagonal conjugate, 3½ in.; conjugata vera, 3 in. A universally and unequally contracted pelvis.

Slight and irregular pains began at 3.30 P.M. on the 19th of January. The os was fully dilated at 6.15 P.M. The liquor amnii began to escape at 6.45 P.M. The presentation was vertex, the position L.O.A. Drs Berry Hart, Freeland Barbour, and Fordyce saw her along with me. We discussed the alternative procedures that might possibly have been adopted for effecting delivery—turning, forceps, symphysiotomy, Cæsarean section. The girl was a pallid, delicate creature, who

appeared to us a bad subject for the graver forms of interference; and at 8 o'clock, the head being still loose above the brim and projecting over the symphysis pubis, I delivered by means of the basilyst, Dr Barbour having his hand applied to the head of the child in the hypogastric region.

Waiving any discussion as to the relative indication in this particular case, what is specially important to have in view is the ease and safety of the whole procedure. With the basilyst the vault was perforated and an opening made wide enough to allow of the complete breaking up of the brain and cerebellum, which were washed out with a lysol douche. The head not descending, the same instrument was screwed into the anterior part of the base and the blades separated in different directions. I was prepared further to basilyse the head, and had the traction blade at hand if it had been required. But, I confess to my own surprise, when I was about to repeat the attack at another part of the base, Dr Barbour, who had his hand on the uterus above the brim, said, "Wait, the head is going down." After a few pains, the uterus, aided by the pressure of Dr Barbour's hands, had brought the head to the pelvic floor, so that with my finger through the opening in the vault it was easily guided on its further course till it was clear of the canals. After the delivery was completed, we made careful examination of the canals, and saw that there was only a slight fissuring of the mucous membrane in the vaginal orifice at the base of the hymen. The patient had an uninterruptedly normal convalescence.

I fancy the basilyst would have found wider acceptance if in the earliest models I had not made the mistake of getting too heavy an implement. Experimenting on heads of infants that had lain some time in pickle, it was necessary to have very powerful instruments to tear up the bones. But since I found that the bones of the fœtus *in utero* are more easily dilacerable, I have had the basilyst (see Fig. 2) made slighter and more manageable. Further, the instrument maker at first had the traction blade so imperfectly adapted to the internal portion that it sometimes slipped. In the newer model this defect is remedied. The internal perforating and external grasping portion fit like the two blades of a cranioclast, so that for

extraction, when that becomes necessary, the basilyst-tractor has the qualities of what is admittedly the best instrument for the delivery of the perforated head.

Dr J. W. Ballantyne thought that the Society was much indebted to Professor Simpson for bringing before their notice the new model of the basilyst-tractor, and for describing so graphically its mode of action. They all knew that on this subject in particular, Professor Simpson was well qualified to speak in magistral fashion, and he thought they were all agreed that when it was necessary to comminute the head, the basilyst was the most effective means of doing it; whether it was possible to look upon the basilyst-tractor as not only the best comminutor, but also the best tractor for the comminuted fœtal head, was more likely to be questioned. At any rate there could be no doubt that the present model was a distinct advance upon the earlier one. It had also to be borne in mind that in attempting to make one instrument do the work that was usually done by two (*e.g.*, by the basilyst and the cranioclast) there was the risk of losing some degree of efficiency. He (Dr Ballantyne) had had the honour, some sixteen years ago, of showing Professor Simpson's basilyst-tractor to several of the leading obstetricians in Berlin and Munich.

Dr Haig Ferguson thought the Society was much indebted to Professor Simpson for his timely paper on Basilysis. It was of great importance to have the subject prominently brought forward again, especially as the basilyst had been recently considerably modified and improved upon since its first introduction, and one could not help being impressed with the many advantages of the instrument shown to-night. It was very instructive to hear that after basilysis it was seldom necessary to use the tractor blade at all in the delivery of the head, and that perforation of the vault could be accomplished with less force than with the ordinary perforator.

Dr Barbour said that he was on this occasion greatly struck with the ease with which the head was delivered. Slight supra-pubic pressure was sufficient to make the head slip through without the application of the traction blade. The risk of sepsis is thus reduced to a minimum, because

no instrument is carried into the uterine cavity, and the possibility of the instrument slipping did not emerge, though this is not an accident likely to occur with this new model.

Professor Simpson replied.

VI. NOTE ON LEVURINE.

By A. R. SIMPSON, M.D., F.R.C.P. Ed., Professor of Midwifery, Edinburgh University.

WHEN I was in Paris during my Christmas holidays, Dr Doyen told me that he had seen some remarkable results from the use of levurine. Madame Doyen was suffering from a carbuncle on the arm, which was beginning to suppurate. Administration of levurine arrested the suppuration and led to speedy subsidence of the swelling. His little boy had acute pneumonia; levurine brought down the temperature. My son, who had the privilege of working in Dr Doyen's clinique, had a sharp tonsillitis, which was checked by the same means.

Dr Doyen kindly gave me half-a-dozen bottles to experiment with. I gave one to Dr Struthers Stewart for the benefit of a patient of his, from whom I had removed the tubes and ovaries in the middle of December. She had suffered for ten years from the effects of pelvic peritonitis. Latterly the right ovary had begun to enlarge. The operation was difficult because of the extent and strength of the adhesions. We specially noted at the time of the operation that the appendix vermiformis was bound to the left tube, and after detachment had an inflamed appearance. She was progressing on the whole favourably till January 5th, when the temperature rose to 102°, and she began to show symptoms of appendicitis. It was for this that the levurine was given her, because although the temperature had come down during the night to 100° it showed a tendency again to rise. Under the levurine it came down nearly to normal, and each time it approached 100° a fresh dose was again given with like result. Dr Stewart told me that he has administered it also in a case of old tubercular ulceration with good result.

In the Maternity, J. M., æt. 19, was delivered of her first

child on January 14th. The two following days she was well. On the 17th the temperature had risen to 100·8° F. in the evening, and the pulse was 120. There were other septic indications which called for the use of an intra-uterine corrosive sublimate douche and the hypodermic injection of a dose of anti-streptococcus serum. The temperature continued to rise, till at 2 A.M. it was 102·4°. It began to come down under a repetition of the intra-uterine douche, but was still at 101·1° next day, when a dose of levurine was administered, with speedy relief of symptoms and reduction of temperature to normal. The following day, the 19th, as the temperature was rising and had reached 100·2° in the afternoon, levurine was again administered, and again with the result that the temperature was reduced, this time to 98°. The child's suckling had been intermitted when the febrile symptoms showed themselves. But now the nursing was resumed, the puerperium ran its natural course, and there being no longer any local or general disturbance, the patient left the hospital on the 24th.

In another patient in the Maternity at the same time the beneficial influence of the drug was seen. She also was primiparous, but had been for some time under observation, suffering from albuminuria. On January 17th she gave birth to dead twins. The following night the temperature being 102·2°, a subcutaneous injection of anti-streptococcus serum was made at 2.30 A.M. The temperature fell to 100·2°; but when it had risen to 101·4° at 3 P.M. of the 18th, the serum injection was repeated. At 6 P.M. on the 19th levurine was administered, as the temperature had risen to 102·3°. A second dose was given at 2 A.M. of the 20th. At 8 A.M. the temperature was 98°. At 8 P.M. it was again up to 101°. Administration of a drachm of levurine brought it down to normal at midnight. At 7 A.M. of the 21st, the temperature being 101·6°, levurine was given once more, with again the same good effect. The chart shows further that it was again administered on the 24th, when the temperature had risen; and after that it was not required.

A young primipara who had had a threatening of pelvic cellulitis after her confinement in the Maternity in December, was sent into my ward in the Royal Infirmary on January 8th,

with a cellulitic deposit in the right side of the pelvis. She had a temperature of 104·3°, which came down under levurine to 98·8°. Notwithstanding that the levurine was administered thrice a day, the temperature rose again to 104° on the third day after admission, and again on the sixth day to 103·3°, with depressions between, sometimes to 97·8°. On the seventh day it did not rise above 99·5°, when her chart notes that the use of the levurine was stopped, and under the ice-bag, which had all along been applied to the abdomen, the cellulitic deposit has been gradually disappearing, and the temperature has not again risen above 100·8°.

Dr Bruce, to whom I had given one of the bottles, writes me: "In the case of carbuncle where I tried the levurine, I thought that the absorption of the inflammatory mass was much more rapid than it usually is in such cases. The case of a fairly large carbuncle, which had been increasing till the levurine was begun, seemed to have in three days almost entirely gone, by absorption, without material sloughing; and in two days more the surrounding hardness with it. In a similar case I should certainly try it again."

Levurine, some of the virtues of which have been illustrated in these cases, is the designation given to a dried extract of beer yeast (*levures de biére*), prepared by M. Couturieux, chemist, and described by him and Dr Aragon in an article in the *Bulletin Medical* of 5th July 1899. A copy of their brochure, accompanying each bottle, states that they were stimulated to the preparation of the drug by a paper in the same journal in 1897, on the use of barm in diabetes mellitus, in which Professor Agrégé Cassaët, of Bordeaux, and M. Beylot, licenciate in science, had recalled previous observations as to the value of yeast in the treatment of furunculosis. Levurine is, therefore, not a new drug, but the yeast of beer so prepared that we have it concentrated in powder form, always fresh, constant in its action, and in an easily administrable form. It may be taken in beer or aerated water, or, to those for whom the taste is too repugnant, in cachets. The dose is a teaspoonful, to be given before food, three times a day if necessary, until the desired effect is attained of arrest of suppuration and reduction of temperature. Whether the levurine produces its effect by

counteracting, as Cassaët and Beylot had suggested, a latent glycæmia, or by acting as a germicide to streptococci and staphylococci, or as an antagonist to their toxines, or in whatever way it works, the results of its administration in the cases I have noted are so striking that I have thought it worth while to bring it thus under your observation.

MEETING V.—MARCH 14, 1900.

Dr MILNE MURRAY, *President, in the Chair.*

I. H. Oliphant Nicholson, M.B., M.S., 20 Manor Place, Edinburgh, was duly elected an Ordinary Fellow of the Society.

II. THE CHRONOLOGY OF ANTE-NATAL LIFE.

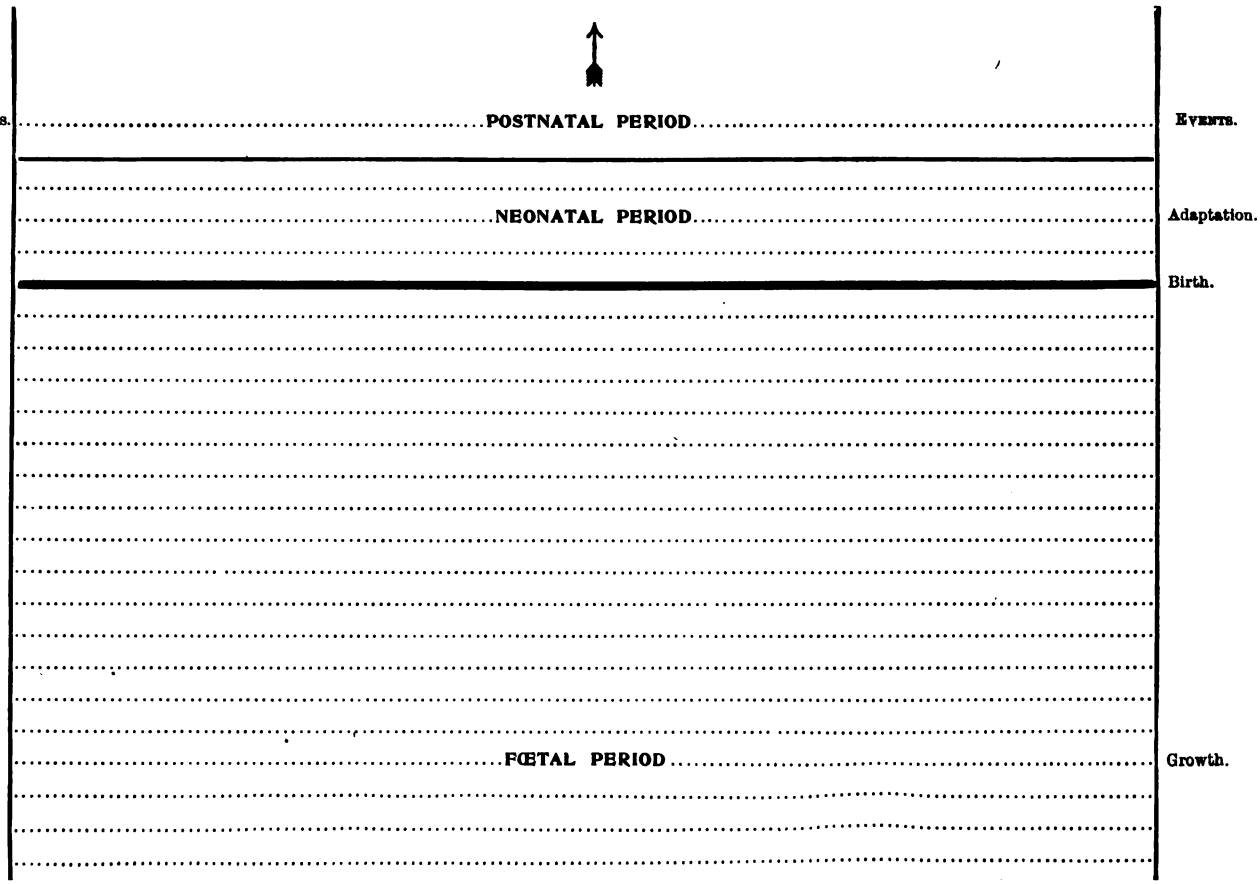
By J. W. BALLANTYNE, M.D., F.R.C.P.Ed., F.R.S.Ed., Lecturer on Midwifery, Medical College for Women, Edinburgh; University Lecturer on Ante-natal Pathology and Teratology, Edinburgh, etc.

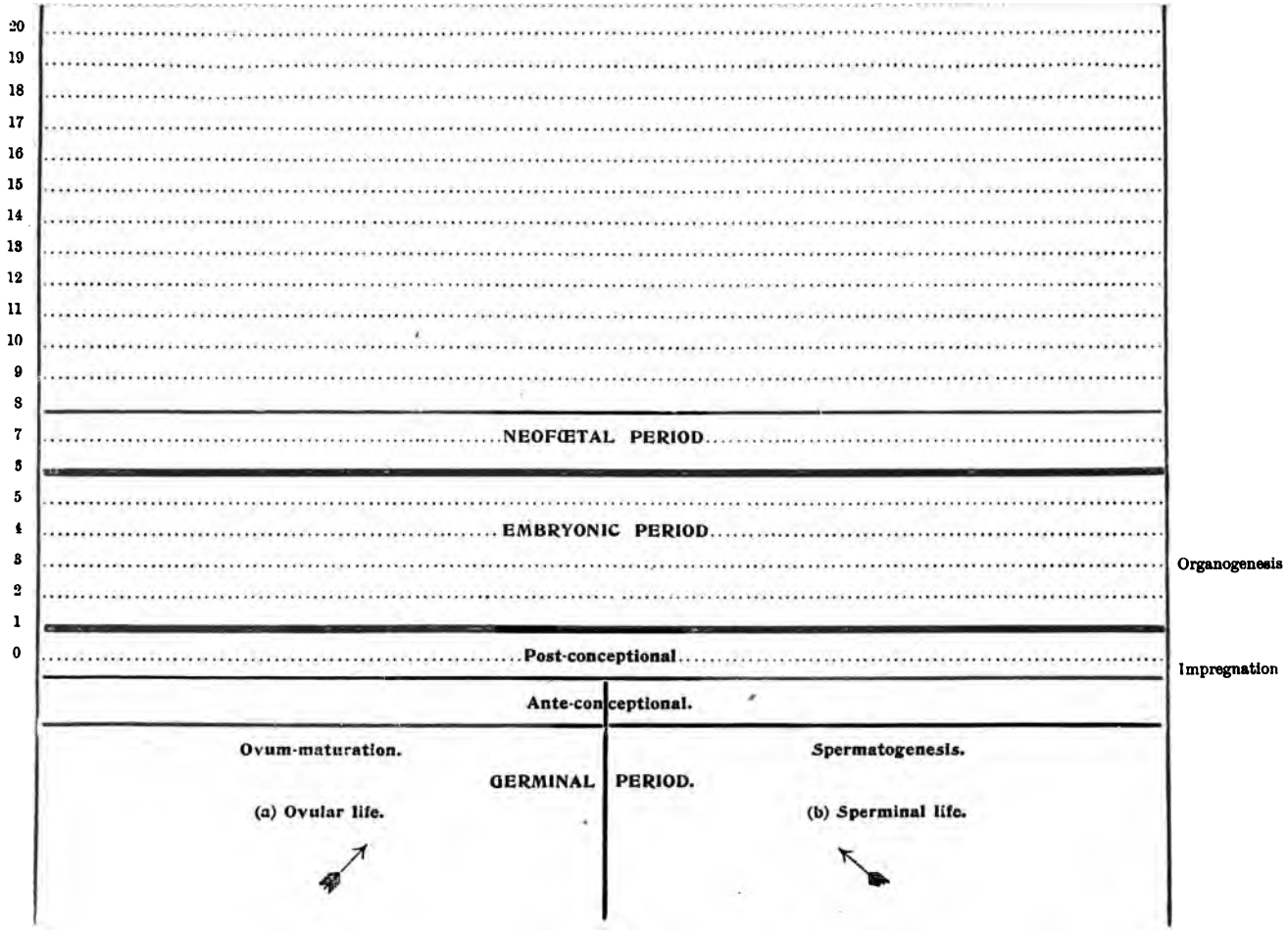
IT is probably no exaggeration to say that few obstetricians have a very clear perception of the progress of events, normal and pathological, during ante-natal life. The drama of embryonic and fœtal development and growth is going on, but the curtain has not been rung up, and the spectators get only confused impressions from the swaying of the drop-scene and from vague sounds, "excursions and alarms," coming from behind it; yet no one doubts the existence of great activity, *post cortinam theatri*, and some from superior knowledge can even judge how preparations are progressing; further, the bill of the play gives an inkling of what is to be soon displayed with great spectacular effect. The two schemes which I am about to describe have been constructed in order to give to the mind a somewhat clearer conception of the chronology of the period of preparation for the great events of post-natal life. That they are far from perfect, I hasten to admit; that they may, nevertheless, be of some use, I venture to claim.

In constructing the scheme of the divisions of ante-natal

Schedule I.

SCHEME OF ANTENATAL LIFE.




20
19
18
17
16
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14
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12
11
10
9
8
7
NEOFŒTAL PERIOD
6
5
4
EMBRYONIC PERIOD
3
2
1
0
Post-conceptional
Ante-conceptional.
Organogenesis
Impregnation
Ovum-maturation.
Spermatogenesis.
GERMINAL PERIOD.
(a) Ovular life.
(b) Sperminal life.

life (Schedule I.) I have employed the "space-for-time" method introduced into medical case-taking by Mr Jonathan Hutchinson. By this plan, all periods of time are represented in the Schedule by equal extents of space, no time is left out, and the whole duration of the ante-natal epoch, with its various events in their proper places, is brought correctly before the eye. Mr Hutchinson has written of the value of the method in ordinary case-taking (*Arch. Surg.*, vii., 199, 1896), and I think it is not less in the recording of ante-natal phenomena, both normal and pathological. The divisions of ante-natal and of early post-natal life, as shown in the Schedule, are grouped in the manner that I have been accustomed to arrange them in my various contributions to the literature of ante-natal pathology during the past four or five years.

Each interspace in the scheme represents a week; and as pregnancy lasts normally for forty weeks, there are forty interspaces intervening between its beginning and end; but as the month following birth is much influenced by what has happened before birth, and is, indeed, a transition period between ante-natal and post-natal life, it also has found a place in the scheme, and has four interspaces. Again, it may be supposed that impregnation happens a few days after insemination, so half an interspace or half a week has been added on at the other end of the table; and below this is the rest of germinal life, which may be said, in one sense, to be without beginning. The thick black lines indicate the divisions between the germinal and the embryonic periods, between the embryonic and the fœtal, and between ante-natal and neo-natal life; the thinner black lines mark off the subdivisions of germinal life and the close of neo-fœtal and of neo-natal life. At the left side of the Schedule are numbers representing the weeks of which intra-uterine existence is made up, and at the right side are named a few of the great events, such as impregnation, organogenesis, growth, birth, and adaptation.

The earliest period of ante-natal life is the germinal, and only a small part of it at the close comes into the epoch of gestation. It has a long, a very long primary dual period, during which an independent life of a cellular kind is going

on in the male and female reproductive cells, the ovum and the spermatozoon. The close of this dual or ante-conceptional period is marked, in the case of the ovum by the phase of maturation, and in that of the sperm by the probably analogous phenomena of spermatogenesis; then follow the dehiscence of the ovisac and the passage of the mature ovum into the Fallopian tube, and the deposition of the spermatozoa in the vagina; and so ovular and sperminal life may be said to run together in impregnation, which may be regarded as occupying the intra-conceptional period of germinal life. The rest of germinal life is the unified post-conceptional period during which the morula mass and blastodermic vesicle are forming, and the first traces of the embryo appearing in the embryonic area. I have attempted to represent some of these facts in the scheme; the dividing line indicates the primary dual character of germinal life, and its absence in the post-conceptional period signifies its replacement by the unified epoch, while half an interspace has been given to impregnation to allow of the well-known fact that insemination and impregnation are not of necessity simultaneous.

The end of the first week of pregnancy may be said roughly to mark the commencement of the second or embryonic period of ante-natal life, which is anatomically demarcated by the laying down of the first rudiments of the embryo in the embryonic area of the blastodermic vesicle. This period has a duration of about five weeks, when it passes not abruptly, but gradually, into a sort of transition time, the neo-fœtal period, which intervenes between it and the distinctively fœtal epoch. The outstanding phenomenon of this embryonic period is the laying down of the scaffolding of the future body; its vitality shows itself in organ-formation or organogenesis; it has been thought by some that these organs are not functionally active till quite the end of this period, but of one at least of them this can scarcely be affirmed, viz., the heart.

The fœtal period of ante-natal life occupies by far the largest part of pregnancy; including the neo-fœtal or transition period, it extends from the sixth to the fortieth week, or thirty-four weeks in all. It is marked by a marvellous growth and by the full establishment of the functions of ante-natal or

intra-uterine existence. The most important event at its commencement is the full formation of the placenta, and its end is the transition from an intra-uterine to an extra-uterine life, viz., birth. Thereafter follows the neo-natal time, when the infant is undergoing certain changes to adapt it to its new environment, when the placental economy is being replaced by the pulmonary respiration and by the gastric digestion. Thus the forty-four weeks are accounted for. Other well-known phenomena might have been printed in the schedule, such as the time of maternal consciousness of the fœtal movements and of medical detection of the fœtal heart sounds; but it was not my intention to fill up the whole scheme in this way, but rather to leave space for observations.

With regard to pathological events, there are two times when death of the unborn is most likely to occur: in the neo-fœtal period (sometimes called on this account, "critical period"), and at or immediately after birth. At both these times there is a kind of readjustment in physiological conditions, with in consequence a predisposition to failure in the process. Short of actual intra-uterine death there may be in the fœtal period the development of various diseases some of which are transmitted to the unborn from the mother, while others seem to arise idiopathically in it. In the embryonic epoch the result of the action of pathological agencies would appear to be the production of malformations and monstrosities of the monosomatous variety; and in the germinal epoch it may well be supposed that double terata, hydatid moles, included fœtuses and blastoderms elliptically deformed and without embryos, are brought into existence. I merely refer to these peculiarities of ante-natal pathology here, they are discussed more in detail in contributions made during 1899.[1]

The schedule may be used for various purposes. It may serve to give the student of the phenomena of ante-natal life a clearer conception of the relative length of the divisions of this existence before birth and of the leading events which take

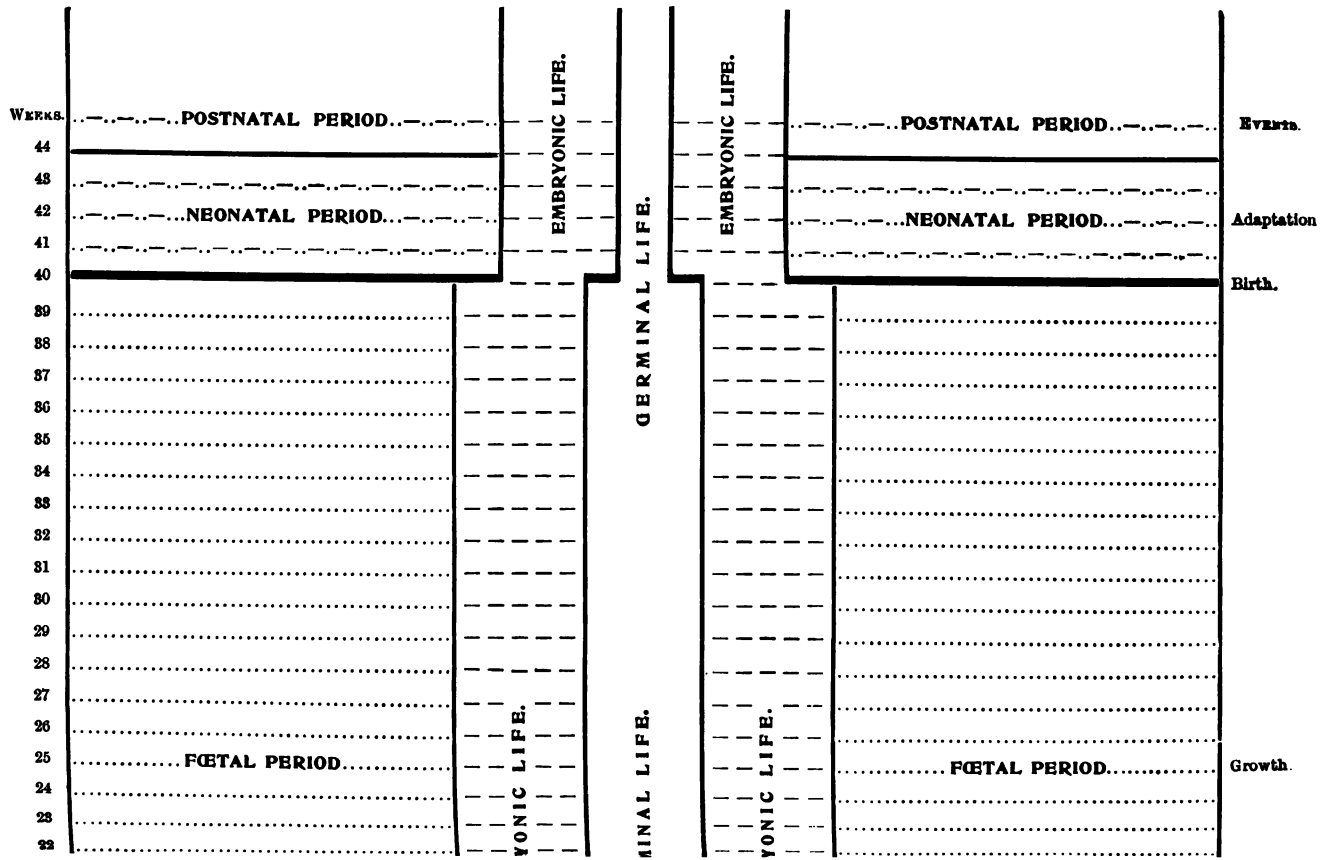
[1] Ballantyne, J. W., "Pathology of the Fœtus," *Scott. Med. and Surg. Jour.*, v. 112, 1899; "Pathology of the Embryo," *Ibid.*, v. 481, 1899; "Ante-natal and Intra-natal Factors in Neo-natal Pathology," *Jour. Amer. Med. Assoc.*, xxxiii. 1245, 1899.

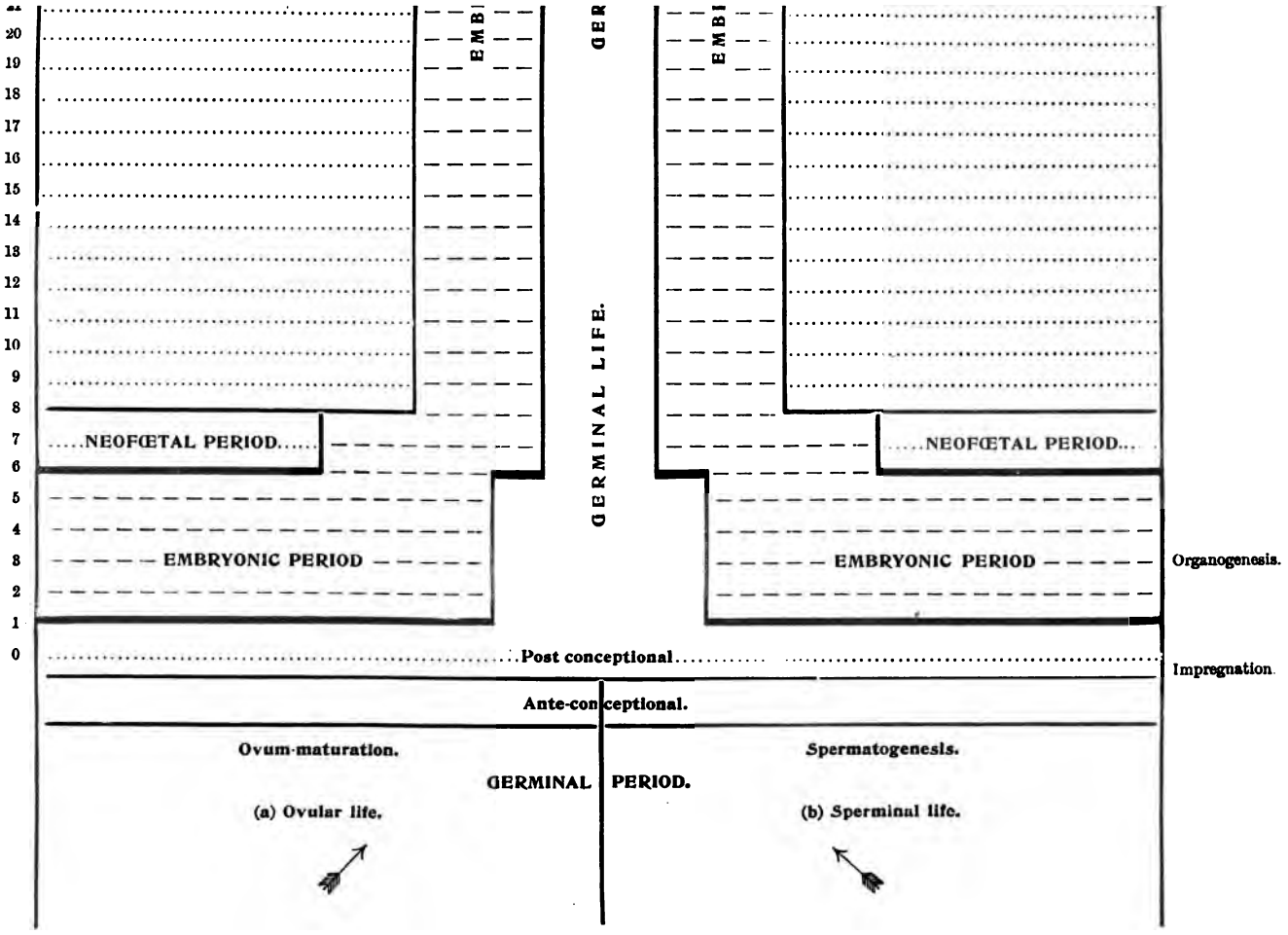
place in it. It may also be of value as a case-taking card for midwifery cases, in which events, normal or abnormal, may be noted in their proper chronological order, and in which such observations as the examination of the urine for albumen with its result, positive or negative, may be inserted. It is impossible to predict in what exact ways the use of the scheme may recommend itself under varying circumstances, but in nearly every case of pregnancy that I have under my care at present, it has shown a new value. It is quite a simple matter to write in events and observations as they occur, and the number of weeks at the left side may be easily replaced by the exact dates if desired. When it is decided to induce premature labour for pelvic deformity or other cause, the weekly measurements of the uterus can be inserted in their proper places and the rate of growth checked and the date of intervention fixed with greater exactness.

The second schedule (Schedule II.) gives what may be called the corrected scheme of ante-natal life. It will probably have already struck the reader that the division of ante-natal existence by hard and fast lines into germinal, embryonic, and fœtal periods is not free from error. It is quite evident, for instance, that all the laying down of scaffoldings is not ended at the end of the sixth week, nor yet indeed at the end of the thirtieth week; all organogenesis does not take place in the embryonic period, but some of it goes on in the fœtal. In order to represent this fact graphically, I have carried a projection of embryonic life up through the neo-fœtal, fœtal, and neo-natal periods into the post-natal. The skeleton and the limbs are good examples of parts of the body whose embryology, so to speak, does not end with the embryonic epoch; the uterus is an instance of the projection of the embryonic still further onwards, *i.e.*, into post-natal life. The germinal period also does not abruptly stop at the end of the first week of pregnancy, the character of abundant luxurious cell formation which so specially belongs to it is projected through the embryonic and fœtal periods, and is seen in post-natal life normally in one organ, the reproductive gland, testicle or ovary. Abnormally it is evident in some forms of neoplasms. The scheme also represents in a graphic form the continuity of the germ-plasm

Schedule II.

SCHEME OF ANTENATAL LIFE.

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GERMINAL LIFE.
.....NEOFŒTAL PERIOD.....
EMBRYONIC PERIOD
.....NEOFŒTAL PERIOD...
EMBRYONIC PERIOD
Organogenesis.
Post conceptional.....
Impregnation.
Ante-conceptional.
Ovum-maturation.
Spermatogenesis.
GERMINAL PERIOD.
(a) Ovular life.
(b) Sperminal life.

and of germinal life. Whether or no there is, under certain abnormal circumstances, a continuity of embryonic life, must be left in the meantime uncertain; it is just possible that in post-natal life there may be occasionally a persistence of the power of forming not only tissues but actual organs, as is seen in ovarian and other dermoids. Normally, however, there can be no new embryonic organogenesis without a repetition of the phenomenon of impregnation. I might have made the scheme more complete if I had represented a projection of fœtal life into post-natal, and more particularly into neo-natal life; but this would have overburdened it, and I have preferred to leave it in its present condition. At the same time there is a very real projection of this kind, and many of the phenomena of early infancy can only be explained by a reference to the preceding fœtal period of life.

It may be added that the schedule is of a size convenient for the typewriter, and those who prefer to print in the events by this means can therefore do so.

III. CHYLOUS ASCITES, WITH AN ILLUSTRATIVE CASE.

By J. Halliday Croom, M.D., F.R.C.S.E., F.R.S.E.; Gynecologist, Royal Infirmary, Edinburgh; Consulting Physician, Royal Maternity Hospital; Lecturer on Diseases of Women, Royal Infirmary, Edinburgh.

Obstruction of the thoracic duct, especially if it be gradual, may give rise to no symptoms whatever during life, since anastomotic channels are established through which the lymph and chyle enter the circulation. However, on the other hand, congestion of the lymphatic system may give rise to definite signs which can be clinically recognised, and this is especially so when the lacteals of the abdominal cavity are within the area affected. A few cases have been recorded in which chylous fluid was found in the pleural cavity, but in all these this was only secondary to a similar effusion into the peritoneal cavity. Only some sixty-three cases of chylous ascites are recorded, so that it is an extremely rare condition, and I therefore feel justified in bringing the notes of the following case before the Society.

Mrs P., æt. 39, was sent to Ward 28 by Dr Prangnell of Grahamstown, on September 29th. She complained of swelling of the abdomen, and gradually advancing weakness and emaciation. Up to within three months of admission she had enjoyed good health, had had six children, the youngest being three and a half years old, and menstruation had been normal and regular. For two months she had noticed the gradual enlargement of the abdomen, and had been losing weight.

The patient was generally somewhat emaciated, and the examination of the abdomen revealed considerable distension, evidently due to ascites. The superficial veins were much distended, the skin was somewhat deeply pigmented, and on deep palpation several irregular hard masses could be detected in the umbilical and epigastric regions. A diagnosis of cancer of the omentum and mesentery with resulting ascites was arrived at. For some time, with careful dieting, the patient's general condition distinctly improved, but occasionally for a day or two she had a relapse, showing itself in sickness, nausea, and vomiting. However, on the whole, after being three weeks in Hospital, she was distinctly better, although the distension of the abdomen was greater, and caused her much more inconvenience.

On the 2nd of November, the abdominal cavity was aspirated, and 380 ozs. of fluid were removed. This fluid presented a remarkable appearance. At first sight it was exactly like pus, but when placed in a specimen glass seemed much more mobile. It had a pale yellow colour with a suggestion of opalescence, and at first was quite homogeneous, showing no deposit, but after standing for about twenty-four hours, a slight creamy layer was found on the surface. It had a sweetish milky odour. Dr Milroy kindly examined the fluid for me, and reported as follows :—"The fluid which was sent to me consisted partly of finely emulsified fat, but more largely of a granular debris consisting mainly of fat. About 2 per cent. of fat was present. The pigment present was lutein."

The granular debris was found on microscopical examination to consist of basophile leucocytes in a state of fatty degeneration.

After withdrawal of this fluid, examination of the abdomen revealed a movable tumour in the region of the gall bladder,

and an indefinite irregular solid mass was detected in the region of the greater curvature of the stomach. The aspiration of the abdomen relieved the patient of her symptoms for some time, but she still suffered from occasional vomiting and inability to take solid food. The vomited matter was examined frequently, but contained no blood. From the 16th of November, that is, about a fortnight after the tapping, remarkable and specially pronounced emaciation set in, while the abdominal cavity became more and more distended with fluid. The discomfort induced by rapid accumulation was so great that although the patient was evidently sinking rapidly, she was tapped again, when about 350 ozs. were removed. The fluid presented exactly the same characters as before. The patient, however, did not seem to improve in the least, but gradually got worse, and died five days later, on the 26th November.

A *post-mortem* examination was made by Dr Welsh, of which the report was as follows :—

"The body showed marked emaciation, and the skin was jaundiced.

"*Thorax.*—Pericardium and heart were practically healthy, but the heart was small and showed some brown atrophy. Each pleural sac contained about 6 ozs. of bile-stained fluid. The sub-pleural lymphatics were studded with minute cancerous nodules; these were not found in the substance of the lung. There were signs of chronic bronchitis and emphysema.

"*Abdomen.*—A few ounces of turbid bile-stained fluid were removed from the abdominal cavity. The small intestine showed some commencing peritonitis. The mesenteric glands were generally enlarged from malignant infiltration. The stomach was much shrunken, and filled with deeply bile-stained mucus. A large cancerous neoplasm was growing from the inner surface of the anterior wall, extending from an inch from the pylorus for 4 ins. along the lesser curvature. In appearance the tumour was a soft fungating mass, raised about one inch above the surface of the healthy mucous membrane, and presented some ulceration in the centre. The tumour consisted largely of soft gelatinous tissue, but was evidently malignant in nature, and had undergone extensive colloid degeneration. The gall bladder was distended with bile, and the glands and tissues

along the larger bile ducts and in the porta of the liver were extensively infiltrated with cancer. The liver itself contained one small cancer nodule. The spleen was healthy, but the kidneys were somewhat cirrhotic and fatty. The small intestine was throughout its whole length greatly thickened and contracted. It showed an immense number of small cancer nodules surrounding the lacteals close to the mesenteric attachment. The lacteals were very extensively occluded. The thoracic duct and the receptaculum chyli were carefully dissected out and were found healthy. There was, however, a mass of infiltrated glands lying close beside and pressing on the receptaculum."

Remarks.—The cause of chylous extravasation is either an obstruction to the flow of chyle, or to distinct rupture of the thoracic duct, or of the *receptaculum chyli.* A few cases of rupture have been recorded, as, for example, by Quincke, in which chylous hydrothorax resulted, and Wilhelm reports a case in which the accident occurred during an attack of whooping-cough. Whitla has also recorded a case of rupture.

Rokitansky recorded a case of peritoneal and pleural effusion in which the fluid was chylous in nature. It was associated with mitral regurgitation and cardiac dilatation. In my case, the chylous effusion seemed to be due to an obstruction to the flow of chyle at the junction of the intestinal mesenteric lacteals. The thoracic duct itself was normal, and the pressure of the cancerous glands around the *receptaculum* was probably not sufficient to occlude it.

Thus, in some cases the lesion was in the thoracic duct itself, whereas in others it has been due to congestion of the larger lymphatic capillaries, or of the smaller lacteals within the mesentery itself. In most of the cases the termination has been fatal, due partly to the original disease, and partly to the consequent starvation.

Some authorities have endeavoured to differentiate between a true chylous ascites and an ascites adiposus, or chyliformis. Microscopically the fluids are similar in appearance, but on chemical and microscopic examination the differences are detected. Senator adopts Quincke's classification, and distinguishes the two as follows:—

In chylous ascites, the microscope reveals very finely granular fat-cells, and an absence of large fat-globules.

In adipose ascites, chemical examination shows the presence of sugar; it shows similar but much larger fat-cell, lymph-cells, and in some cases cancer-cells.

This variety occurs chiefly in tubercular or malignant peritonitis, and is a result of a fatty degeneration of the serous endothelium, and of lymph and pus cells.

Although this view is very generally accepted, a few authorities maintain that the difference cannot be held as absolute, for they assert that, since sugar is absorbed chiefly into the portal circulation direct, and only a minute quantity, if any, by the lacteals, the presence or absence of sugar cannot be considered of any importance in differentiating between the two conditions. Further, they seem disinclined to believe that fatty degeneration of endothelial tubercular or cancerous cells could occur to such an extent as to give ascitic fluid such definite characteristics.

In a recent paper read at the Société Médicale des Hôpitaux, MM. Fernand Widal and Prosper Merklen discussed lactescent ascites of lymphatic origin. They pointed out that many authorities regarded milky fluid in the abdominal cavity as chylous in nature. Others, however, consider that the fat might be due to fatty degeneration of extravasated cells. M. Lion first showed that milky ascitic fluid might be other than chyle. In a case of cancer of the ovary, he found that the liquid contained a substance analogous to casein, but no fat. M. Aschard and M. Apert respectively published cases in which the fluid when examined under the microscope showed no fatty globules, but innumerable minute refractile granules. MM. Widal and Merklen hold that the distinction between chylous and non-chylous ascites presents great difficulties, and further, that in the chylous variety the quantity varies very much in different cases and even at different times in the same case. They also point out that the kind of leucocytes found in the effusion show that chylous ascites may be lymphatic in origin, and they record an illustrative case. Microscopic examination of the fluid removed showed no fatty particles, but abundance of leucocytes, 90,000 to 100,000 per cubic millemetre.

Only cells of different sizes, all with a single nucleus, were discovered. At the autopsy, no peritonitis was found, and even though there was no apparent lesion of the abdominal lymphatics, the milky liquid was proved lymphatic in origin. The patient had cirrhosis of the liver and tubercle of the lungs.

Dr James Ritchie said that the microscopical characters of the deposit from the ascitic fluid indicated that, in addition to the lesion affecting the thoracic duct, there must have been some peritonitis to account for the degenerating basophile leucocytes. He was astonished to find it noted that there were very slight traces of peritonitis.

IV. COMPLICATED CASE OF DOUBLE OVARIOTOMY IN A GIRL AGED EIGHTEEN.

By J. Halliday Croom, M.D., F.R.C.S.E., F.R.C.P.E., Consulting Physician, Royal Maternity Hospital; Gynecologist, Royal Infirmary, Edinburgh.

G. S., æt. 18, was first admitted to Ward 28 in the Hospital, July 1897, complaining of a swelling of the abdomen which had been noticed for sixteen months. The patient had never menstruated, but stated that at the age of fifteen she had some swelling of the abdomen, which, however, gradually disappeared. Before admission the abdomen was tapped three times, on May 1st, June 10th, and July 15th. She had never complained of pain till a few days before she came into hospital. On admission the patient was very anæmic, and her face, neck, and chest were much emaciated, the abdomen was enormously distended, and her lower extremities were very œdematous.

Examination of the chest revealed the fact that the right pleural cavity was full of fluid, and the apex of the heart was found in the left axilla.

The surface of the abdomen showed the presence of numerous distended veins and many recent striæ, while the umbilicus markedly protruded. The note on percussion was absolutely dull in every part, while fluctuation was easily determined. The girth of the abdomen at the level of the umbilicus was 40 ins.

A few days after admission the right pleura was tapped, and 144 ozs. of blood-stained serum were removed, and a few days later still, 280 ozs. of pinkish-coloured fluid were aspirated from the abdomen. Thereafter, on examination, the presence of a large tumour, occupying chiefly the left and lower parts of the abdominal cavity, was made out. It was very hard, irregular in shape, and presented all the features of a malignant ovarian tumour, and as such it was then diagnosed, and the condition was considered a hopeless one. From July 1897 till April 1898 the patient lay in the ward, extremely exhausted and emaciated, although she never seemed to get specially worse. Exploratory incision, far less any attempt at operation, was not thought of, and, as a matter of temporary relief, her abdomen was tapped regularly once a fortnight and fluid removed, varying in quantity from 300 to 500 ozs. Examination of the fluid showed that it was mainly ascitic.

The right pleural cavity was also tapped during this period on four occasions, each time from 100 to 120 ozs. being removed. The œdema of the lower limbs was also frequently relieved by Southey's tubes. Gradually one was forced to the conclusion that, since the patient's general condition had become really no worse than on admission, and since the condition in the abdomen had not changed in any way, the tumour might not, after all, be malignant, and therefore it was decided that the abdomen should be opened, and, if possible, the tumour be removed. Accordingly, on April 5th, 1898, I operated, and removed one of the largest dermoid ovarian tumours I have met with. It weighed, even after tapping, about 30 lbs. It had developed from the left ovary, and the operation was comparatively simple, the pedicle being well defined, and the adhesions few and easily separated. The right ovary, which was apparently healthy, was left intact. After the operation the patient was extremely collapsed, but with free stimulation she speedily revived and made an excellent recovery. The œdema entirely disappeared, and the extensive general emaciation became more and more striking, but in the course of a few weeks the patient put on flesh rapidly, and by June 7th was sufficiently well to

be sent to the Convalescent House, and a fortnight later she left for her home in Shetland.

She was re-admitted to Ward 28 on September 30th, 1899, when she appeared a tall, stout, well-built, healthy-looking girl. She had menstruated regularly since the last operation. She complained of a swelling of the abdomen which she had noticed for six weeks before admission. Examination of the abdomen revealed a large hard tumour occupying the middle line, and growing upwards, especially towards the right side, so that the dulness was almost continuous with that of the liver.

The diagnosis was that probably this was an ovarian tumour occurring in the ovary which had been left. On November 7th the abdomen was opened by an incision a little to the right of the previous cicatrix, and this, before the operation was completed, had to be extended well above the umbilicus. The tumour which came into view was cystic, and on puncturing it a large quantity of brownish fluid escaped. The wall in some parts was very thick, and consisted largely of soft fatty-looking, friable, lobulated tissue, which crumbled away when taken hold of either by the fingers or by forceps.

There were several adhesions, and at one part the tumour was intimately adherent to the small intestine, so much so that they could not be safely separated, and a piece of tumour wall about four inches by two was left adherent to the intestine after having been trimmed with scissors.

The pedicle, which was very broad, was secured by two ligatures, and the peritoneal cavity was thoroughly washed out. A drainage-tube was inserted, the wound closed, and the patient put back to bed. She was extremely collapsed, and all the afternoon had great pain, and was inclined to be very restless. She was very cyanosed, and the pulse was small, thready, and very weak. Brandy enemata and other stimulants were given. The tube was removed the next evening, and she gradually improved. The stitches were taken out on the sixth evening. Later a dry dressing was put on, and on the 28th, three weeks from the date of operation, the patient was up and looking perfectly well.

The microscopical examination of the tumour showed that it was a simple cystic papilloma.

This case seems to me to present many interesting features, but probably its chief importance lies in, first of all, the difficulty of diagnosis when the patient was first seen. The patient was admitted presenting every possible sign of abdominal cancer except her age, which, of course, is not of itself preventive, and it was only after she had laid in the ward and had been treated by palliative measures that the abdomen was opened. It must be extremely rare indeed to remove stained fluid from the pleura which is not associated with malignant disease. As far as I am personally concerned, I have not seen a case before.

This is quite in keeping with one's previous experience, and suggests that in all cases where there is room for the least element of doubt an exploratory incision should be made. And yet how very much oftener on so opening the abdomen is one met with disappointment and with the fact that the condition is hopeless. The case also raises the question of the removal of the other ovary at the time of the first operation. In this particular case I have no regrets, for on the first occasion the other ovary was most carefully examined and seemed perfectly healthy, and therefore, especially as the patient was only nineteen years of age, it was left intact. Indeed, even though there had been evidence of commencing cystic disease I think I should have been tempted, if not to leave it entirely alone, at most to remove if possible only the part of the organ affected. I admit it is a difficult matter to tell whether an ovary is really diseased or not, because the perfectly functioning organs present such differences of appearance; but in this case, at all events, the ovary seemed to be perfectly healthy, and therefore was left.

Another point is, that where there are extensive adhesions to the bowel, as in this case, and especially where the adhesions are very intimate, it seems to me safer and better to leave portions of the tumour adherent to the bowel, than to peel it off and leave large bleeding surfaces, or to have perforations which require to be dealt with carefully, and prolong the operation.

V. NOTES OF FIVE CASES OF ECLAMPSIA TREATED BY SALINE INFUSION.

By ROBT. JARDINE, M.D. Edin., M.R.C.S. Eng., F.F.P. & S.G., Physician to the Glasgow Maternity Hospital; Examiner in Midwifery to the University of Glasgow.

LAST session I gave notes of twelve cases of eclampsia treated by saline infusion. In my Clinical Lectures on Hæmorrhage and Eclampsia, published by Clay, notes of five additional cases are given. I shall now give notes of five more, which have been treated since the beginning of this year. In these last cases the injection used has consisted of one drachm each of acetate and chloride of sodium to the pint, *i.e.*, the normal saline solution with a drachm of acetate of soda added. In every case the diuretic effect has been prompt and marked.

CASE I.—Mrs B., æt. 20, ii-para, sixth month; admitted Jan. 12th, at 11.45 P.M.

For two days previous she had had a violent headache and some sickness. Convulsions came on in the evening, and she had had six fits by the time of admission. Her face was puffy, but there was no marked œdema. She was semi-comatose. A catheter specimen of her urine became quite solid on boiling. The os admitted one finger.

The treatment adopted was a large dose of salts, 10 grs. of chloral hydrate hypodermically, 2 pints of saline solution, and a hot pack. As the fits continued, I cleared the uterus by accouchment forcé. The hot pack and chloral were repeated. Free diuresis was quickly established, and the bowels acted well.

The fits continued until the evening of the 13th, that is for about twenty-four hours. She had in all twenty-eight—ten before, and eighteen after delivery. At noon on the 13th I gave her 2 pints more infusion and 10 ℥. Tr. verat. viride hyperdermically. During the next two days she was very stupid, but could be roused. She was passing plenty of urine, and the bowels were acting freely. The arm into which the chloral had been injected became inflamed. Hot boracic applications soon relieved it. By the 16th she was quite conscious. The albumen had almost entirely disappeared.

Early on the morning of the 17th she became deeply comatose, and remained so the whole day. Dr Oliphant saw her with me in consultation, and we practically gave up hope of saving her. She was fed through a tube with meat juice, brandy, and milk, 2 pints of saline were infused, and 10 ℥. Tr. verat. viride given. At 2 and 9 A.M. on the 18th she was again fed through the tube. By this time the coma was lessening, and her mind became quite clear during the 19th. After that her recovery was uninterrupted. The urine drawn off during the coma was loaded with bile pigment, but there was very little albumen in it. She was excreting large quantities of it. What was the cause of this second attack of coma? She had not had any fits for nearly four days. What inferences are we to draw from the sudden loading of the urine with bile pigment? I hope some of the Fellows may be able to throw some light on these matters.

CASE II.—J. M'K., æt. 17, i-para, full time.

This case was brought in by Dr Martin. Her health had been good during the pregnancy. On Jan. 28th, about 7 P.M., her first fit had come on, preceded by severe headache. She had had seven fits before admission, at intervals of about twenty minutes. A hypodermic of ½ gr. of morphia had been given. She had three fits in the Hospital before delivery, and four afterwards, making fourteen in all. There was a considerable amount of albumen in her urine. The os was partially dilated. The pupils were contracted to a pin point. With the onset of a fit they dilated widely, and as soon as it passed off they at once contracted.

The treatment adopted was a large dose of salts, 3 pints saline infusion, 10 ℥. Tr. verat. viride, dilatation and delivery with forceps, and a hot pack.

She made a good recovery, but suffered some pain for a few days from a patch of dry pleurisy. She passed urine freely after the infusion, and the albumen quickly disappeared. In this case the morphia did not seem to affect the excretion of the kidneys, but as the urine was passed into the bed, we could not measure the amount.

CASE III.—C. S., single, æt. 16, i-para, full time. This patient was admitted from the Deserted Mothers' Home. The labour was somewhat prolonged as her pelvis was slightly contracted. There was no œdema, nor did the patient complain of headache. When the head was near the outlet, and shortly after the bladder had been emptied by catheter, she was seized with a violent convulsion. She had two fits before delivery and four after. She was delivered with forceps. The child weighed seven pounds and was alive. Three pints of the saline solution were run in under the right breast, 10 ℥ Tr. verat. viride given, a hot pack applied, and a large dose of salts given. The urine was not heavily loaded with albumen. Her recovery was uninterrupted after the fits ceased.

CASE IV.—M. C., æt. 22, i-para, admitted February 16th. This patient was sent in by Dr Stirling, with the history of having had ten fits during the preceding twenty-four hours. She was unconscious, but could be roused. There was considerable œdema of the legs and feet, and the labia were very much swollen. The os admitted a finger. The pelvis was contracted, the C. D. being $4\frac{1}{4}''$. The urine was loaded with albumen.

Treatment.—A large dose of salts, 2 pints of saline, 10 ℥ Tr. verat. viride, labia punctured, os dilated manually, and the child delivered by craniotomy. I did craniotomy at once, as the child was already dead. She was put in a hot pack, which was repeated an hour later.

During the 17th she was fairly well, but had three fits. She was given three pints of saline infusion and 10 ℥ Tr. verat. viride. She was passing urine freely.

On the 18th she had a fit at 2.55 A.M., and a second one an hour later. At this time there was conjugate deviation of the eyes to the right. Her condition now became rapidly worse, and when I saw her at 11 A.M. she was dying. There was now conjugate deviation of the eyes to the left. The left arm seemed paralysed and the face slightly drawn towards the right side. The pupils were equal. Both knee-jerks were present. She died a few minutes later. Dr Carstairs Douglas,

who saw her with me, agreed that it looked as if there had been a brain lesion, but the post-mortem examination which he subsequently did revealed no lesion.

The brain was somewhat anæmic, but otherwise healthy throughout. The kidneys were slightly diminished in size, but their substance apparently healthy. A microscopic section revealed nothing abnormal except slight blocking of some of the tubules with epithelium. The liver was somewhat enlarged, and showed distinct evidence of nutmeg character. The microscopic section showed the cells markedly degenerated. The heart was practically normal, with slight roughening of the mitral valves. The lungs were both œdematous, and the right showed extensive old pleuritic adhesions and calcareous nodules on it, evidently from old tubercular disease. The uterus showed no evidence of inflammatory mischief.

The post-mortem examination showed nothing to point to the cause of death, unless the condition of the liver prevented the poison from being eliminated. Her kidneys were certainly doing their work well.

I must say I was disappointed in losing this case; but considering that she had been having fits for twenty-four hours before I saw her, perhaps it is not to be wondered at.

What treatment, if any, had been tried before she was sent to us I do not know. I would like to suggest to the men who send these cases in, that a note of their treatment would be both useful and interesting to us.

CASE V.—Mrs L., æt. 20, i-para, admitted March 2nd. This case was treated by Dr Black, to whom I am indebted for the notes.

On March 2nd she was delivered at her home by Dr Thompson of a full-time healthy child. Her pregnancy had been uneventful. Forceps was applied at the outlet without $CHCl_3$. Beyond the patient being somewhat excited, the doctor noticed nothing peculiar about her. About four hours after delivery, while he was visiting her, she was suddenly seized with a fit. About two hours later she had a second seizure, and then began to have them in quick succession. He

gave her $CHCl_3$, which stopped the fits, but as soon as she was allowed to come out of the $CHCl_3$ they recurred. She had about six fits before admission.

When admitted she was extremely restless and only semi-conscious. There was merely a trace of albumen in the urine. The treatment adopted was a saline infusion of 1½ pints twice within a few hours, free purgation, and 40 grs. of chloral and 60 of bromide in two doses. The fits continued, and within sixteen hours after admission she had eleven in all. She was then given 10 ♏. Tr. verat. viride. She had two fits within the next five hours, and they then ceased. She remained stupid for two days longer, but is now doing well.

In all the twenty-two cases this is the only one in which the fits first occurred during the puerperium, and this is the only one in which there was merely a trace of albumen in the urine.

Twenty-two cases treated by this method have now been recorded by me, and I think they are sufficient in number to enable one to estimate the efficacy of the treatment. Of the twelve cases given before this Society last year, four were fatal. The first one which was fatal should not have been included, as only the normal saline solution was used; besides she was moribund when admitted. Of the last ten recorded, two have died, but one of the deaths was due to a perforating duodenal ulcer on the seventh day after her eclampsia had been cured. Even if we take the death-rate as six in twenty-two, looking at the nature of the cases, I think it will compare favourably with the rate after any other method of treatment. If we deduct the two cases, it leaves us four in twenty-one, which is very favourable, considering that a good many of the cases only came to us after they had been having fits for many hours. I know that several of them were sent to us after a consultation had been held and a hopeless prognosis given. In hospital work we have to deal with the very worst cases, and the majority of these were certainly bad enough to test any treatment.

I think I may fairly claim to have established that this method of treatment is worth trying. There is no risk in giving these large infusions. I must have given at least

200 by now, and I have never had a single abscess form. Of course rigid aseptic precautions are necessary.

Dr Halliday Croom said that he thought that the thanks not only of the Society but of the Profession were due to Dr Jardine for bringing forward any means of successfully dealing with eclampsia. Although he had been teaching for years, he felt that its pathology and treatment were as much a mystery as ever. He had no intention of entering into the question of albuminuria and its relation to eclampsia. Dr Jardine had produced a series of cases which he had successfully treated this way, and he thought that he had added considerably to our means of dealing with a very difficult complication. Dr Croom heartily congratulated Dr Jardine on his success, and hoped that his persevering investigations would be crowned with still further success.

Dr James Ritchie asked whether the patient who had recurrence of coma five days after confinement had any febrile or other condition to account for the recurrence. He had met with only one case in which the occurrence of eclampsia was instituted *post-partum*. This was in a young woman immediately after delivery of the afterbirth. On examination he found the legs œdematous, the first urine passed was loaded with albumen, but the following day the urine was practically free from albumen.

VI. PATHOLOGICAL AMENORRHŒA FROM OTHER THAN CONSTITUTIONAL CAUSES, WITH ILLUSTRATIVE CASES.

By F. W. N. Haultain, M.D., F.R.C.P. Ed., Gynæcologist, Deaconess Hospital; Assistant Physician, Maternity Hospital, Edinburgh.

In the absence of pregnancy and deteriorated constitutional states, amenorrhœa is by no means a common condition.

From a general point of view it may be classified as of two types, primitive and acquired; and from a physiological aspect each may be considered as due to—(1) Atresia of the canals; (2) Uterine conditions; (3) Ovarian conditions.

Under the first heading of Atresia we may have the block to the exit of the menstrual fluid, situated either in the cervix

(atresia cervicis), in the vagina (atresia vaginalis), or at the hymen (atresia hymenalis); this last type may be considered as a variety of atresia vaginalis, but from the differences in its clinical signs it is usually described separately.

I shall merely relate an example of each of these varieties which has come under my notice.

CASE I.—*Atresia hymenalis.*—K. W., æt. 15, had complained of severe periodic monthly pain for about nine months, which latterly had become more or less constant. She had never menstruated. On examination, a slightly bulging mass projected from the vulva, and per rectum the pelvis was felt to be filled by a fluid swelling, most distinctly felt through the anterior rectal wall. The treatment consisted of excision of a portion of the bulging hymen, through which the tarry retained menstrual fluid was allowed gradually to drain into cotton-wool for forty-eight hours. After this time antiseptic vaginal syringing was adopted. The patient is now the mother of two children.

CASE II.—*Atresia vaginalis.*—J. D., æt. 14, complained of a right-sided abdominal swelling about the size of a cocoanut, and also gave the history of having suffered from paroxysms of pain of an irregular nature for nearly a year. Menstruation had not occurred. Examination showed vulva well developed, but no introitus vaginæ. Rectal examination elicited a fluid swelling bulging through the anterior wall about 1½ in. from the anus; the swelling was continuous with the abdominal tumour. The diagnosis being clear, a careful dissection was made, commencing between the anus and urethral orifice. Two loculi were opened into, from each of which escaped a small quantity of thickish yellowish fluid. The lower extremity of the large cyst was then incised, and a thickish glass-tube inserted. By this means a large quantity of thick tarry fluid was allowed to drain for forty-eight hours; after this the patient was again anæsthetised, the previous opening was then enlarged, and the cavity washed out with 1 to 40 carbolic. Into the canal was now fixed a large crystal dilator, which was worn for two months.

The patient was operated on five years ago, and has menstruated regularly ever since. Vaginal examination, however, now shows great contraction of the upper portion of the canal, which with difficulty admits the tip of my forefinger.

It will be noted that, in the evacuation of the contents, slow drainage was employed in preference to immediate emptying and thorough washing out, as I considered by this means a safer adaptation of the distended organs would occur, and thus the danger of tearing possible adhesions to surrounding structures would be minimised. I need hardly add, the strictest antisepsis was enforced.

CASE III.—*Atresia cervicis.*—B. M., æt. 24, was sent to me by Dr Haddow of Govan. She complained of having for the last seven years suffered from irregular attacks of pain of a severe nature, situated in the lower abdomen, and chiefly in the right side. Menstruation had not appeared. On vaginal examination, the vagina and vulva appeared normal, the cervix was small and conical, and into it the sound could scarcely be passed an inch. Bimanual examination showed the pelvis to be occupied by a very tender, indistinct, adherent mass, particularly prominent on the right side. The diagnosis made was enlarged and adherent Fallopian tubes and ovaries, with an atrophic uterus, and removal of the appendages by abdominal section was undertaken.

The abdomen when opened showed evidence of previous general peritonitis, and the intestines and omentum were found adherent to the anterior parietes. The pelvic swelling was found to be composed of a uterus unicornus. The right horn was very rudimentary, and distended with a tarry substance, while between the layers of the broad ligament a considerable amount of the same tarry material was found, as if it had escaped from rupture of the distended uterine horn. The ovaries on both sides were much enlarged, and showed signs, from the number of blood cysts and extravasations in their substance, of intense congestion. They were embedded in the pelvis by strong inflammatory adhesions. By careful dissection they were enucleated and removed, and the rudimentary horn

was divided as near the larger horn of the uterus as possible, and the contents evacuated. The edges of the sac were then invaginated and stitched together with a continuous suture, and over all the peritoneum was drawn and carefully stitched. The extravasated blood between the layers of the broad ligament was carefully washed out, and the upper edges of the ligament stitched together. As can be surmised, the operation was prolonged and tedious, but the patient, a strong, healthy girl, recovered without an untoward symptom.

The case in its essential characteristics simulates in some degree that described by Dr Lackie to the Society, and which, through his courtesy, I had the pleasure of closely observing. In his case, however, the uterus was in a more forward state of development, and the patient menstruated regularly from one horn.

The only feature of special interest in these cases, generally, was the irregularity of the pain complained of. In Case I. it was markedly periodic, and occurred at monthly intervals, but in Cases II. and III. there was no periodicity, long periods were present between the paroxysms, a circumstance which tended greatly to obscure the diagnosis, and in Case III. closely simulated recurrent attacks of appendicitis.

Of more general interest, from their greater frequency, are those cases of amenorrhœa due to functional inactivity of the uterus and ovaries. In fact, it is questionable if the cases already quoted are true examples of amenorrhœa. They may be properly described as examples of concealed menstruation.

Absence of menstruation, whether primitive or acquired, must, in the present uncertain state of our knowledge of the physiology of normal menstruation, be surrounded with difficulty of explanation. But there are certain known facts which, from a practical standpoint, are of importance in the elucidation of this difficult subject. In the first instance, it is incontrovertible that the ovaries are essential for the institution of the menstrual function; want of development of these organs is always attended with amenorrhœa. In like manner it must be admitted that a totally undeveloped uterus is

always associated with a similar condition. *A priori*, then, one must assume that menstruation is instituted by the development and functional activity of both organs. Development of either alone is insufficient. Puberty may be defined as a phase in female life, associated among other things with principally the development of the sexual organs and instincts. Normally, they are developed coincidentally, but are quite independent of each other. Thus we may have pathological states resulting from irregular development. The imbecile may be developed in her sexual organs as a veritable Hebe, yet at the same time be utterly devoid of sexual instincts. In like manner, sexual instincts may be acute in women totally devoid of functionally active sexual organs.

Further, well-developed functionally active ovaries may be present without any development of the uterus, and *vice versâ*.

In these last instances primitive amenorrhœa is present, as evidenced by the following cases:—

CASE IV.—M. F., æt. 25; never menstruated; complained of irregular severe pain in lower abdomen, which had lasted for several years, and incapacitated her from working. On examination, the cervix uteri was found to be extremely small, while each side of the pelvis was occupied by an exceedingly tender matted mass. Abdominal exploration by laparotomy showed an extremely small uterus, about the size of a filbert nut, and on either side an adherent irregular purplish mass. These were removed, and, on examination, were found to be large, congested ovaries and distended Fallopian tubes. Since their removal the patient has been entirely relieved from pain, and is now working steadily. The presence of blood in the Fallopian tubes is of interest in regard to tubal menstruation.

CASE V.—F. G., æt. 27, married three years; sterile, never menstruated; consulted me regarding her sterility and absence of menstruation and leucorrhœa. On examination, the uterus appeared normal, sound passed $2\frac{3}{4}$ in., no ovaries could be palpated. All forms of treatment proved unavailing in instituting menstruation.

In Case I. we have a typical example of want of uterine development as the cause of amenorrhœa, while in Case II., which is one of several similar that have come under my notice, it is probable undeveloped ovaries were the cause of the absence of menstruation.

Another class of case of primitive amenorrhœa, of which I have seen several examples, is more difficult to explain, namely, where, as far as can be recognised by examination, both ovaries and uterus are apparently normally developed in so far as size is concerned.

A striking example of this class I saw with Dr Milne Murray, the patient being a particularly well-developed girl of 22, in whom the ovaries were palpable and appeared normal in size, while the uterus admitted the sound for 2½ in., and in shape and consistence appeared normal also.

The cause of the abeyance of the menstrual function here (assuming that the size of the ovaries and uterus shows development) can only be looked for in the hidden precincts of that great unknown, namely, central nervous system. There is probably here present a much greater influence on the regulation of sexual functions than is generally credited, as we will later see in discussing acquired amenorrhœa.

To the practical physician, cases of primitive amenorrhœa, though doubtless interesting, are from a clinical standpoint unsatisfactory, in so far as successful treatment is concerned. Want of development of an organ, be it organic or functional, is usually beyond the scope of therapeutics. By removal of the organs, as in Cases II. and IV., the pain and suffering can be removed; but this is not curing the primary disease, it is merely removing the secondary manifestations. In some instances, however, treatment may be attended with success. These cases are met with as the result of long-continued anæmia and constitutional debility in early womanhood, where, after the anæmia has been cured, a permanent want of functional activity of the organs remains. Much may here be attained by the judicious use of electricity, so long as the organs show little want of development physically. These cases, however, are closely allied to acquired amenorrhœa, under which they will be more satisfactorily described.

Acquired Amenorrhœa.—Inactivity of the sexual organs, so far as concerns menstruation, may be the result of impairment of the functions of the ovary, uterus, or controlling nerve centre.

Perhaps the most frequent is the last, and it is one which is too often overlooked. That the sexual organs are intimately associated with and controlled by nervous impulses is supported beyond controversy; as examples might be quoted, the amenorrhœa of fear after illicit intercourse, the effect of a sudden shock, the inertia which follows depression during labour, or the stimulating action on labour pains of encouragement. Many other examples might be mentioned.

It is to this cause that the delayed or suppressed menstrual function, so frequently noted in girls the subjects of over-study, is probably due, as evidenced by the beneficial effect of prolonged rest from work. It is perhaps not too much to anticipate that the "new woman," in her competition with man, may in due course propagate a race of feminine individuals, who will still further imitate the male by having the menstrual function entirely suspended. Fortunately, however, apprehension on this score is unnecessary, as from want of functional activity in these organs further propagation will be impossible, and the anomaly cease.

Permanent absence of functional activity in the ovaries and uterus, with resulting amenorrhœa, may be induced by a prolonged period of enforced cessation of the menses, through anæmia and other enfeebled constitutional states. The uterus, previously well developed and active in these cases, may from its inactivity become atrophied and small, and the ovaries more or less inert, and it is here that some benefit may be derived from treatment. A similar condition may be met with without any known cause. As an example of several of such cases I have met with, the following may be quoted:—

Case VI.—Mrs Y., æt. 25, married four years, no family, one miscarriage a few months after marriage, was sent to me by Mr Hudson. She complained of amenorrhœa and sterility, the former having lasted for eight months; for a year previous to that time the menses had steadily diminished in amount.

She looked and felt in perfect health, and had always been so.

Vaginal examination showed the uterus and ovaries to be apparently normal; the sound, however, entered the uterus slightly short of 2½ knob.

Treatment by the intra-uterine application of electricity, negative pole (Apostoli), was adopted. After four applications, menstruation returned. One period only occurred, the subsequent one was arrested by impregation, which resulted in the birth of a healthy child.

Acquired amenorrhœa may be also due primarily to want of ovarian activity alone. In these cases the uterus remains for a time, at any rate, normal in size, but in due course diminishes from secondary inactivity. I have here found treatment by ovarian extract in several cases entirely successful after absolute cessation of menses had been present for more than a year. Particularly beneficial, however, have I found this method of treatment in relative amenorrhœa, where, though not entirely absent, the flow was scanty and the patient suffered from plethora and obesity. One marked case was sent to me by Dr Simla Paterson, and is worthy of mention.

Case VII.—Mrs P., æt. 29, no family; complained of headaches, flushings, great obesity, and scanty but regular menstruation, which for the previous year had lasted for only a few hours each period. She weighed almost 15 stones. Bimanual examination being impossible, the sound was used to examine the uterus, and it was found to pass quite 2½ ins. Treatment by ovarian extract was adopted. In the course of ten days a profuse uterine hæmorrhage occurred, accompanied by complete relief of the headache and lassitude. The periods occurred regularly, were most profuse, and lasted over a week, and in three months she had diminished in weight 2½ stones.

Typical cases, such as those I have detailed, cannot but incline one to the view that amenorrhœa may be caused by simple inactivity of the ovaries or uterus, independently of one another. That the organs are in close sympathy with each

other there can be no doubt, as is evidenced by the very general, though not absolutely certain cessation by menses and atrophy of the uterus following oöphorectomy, which demonstrates the ovarian influence on the uterus. What the action of removal of the uterus on the ovaries is, has yet to be determined.

From this intimate functional connection with each other, a cessation of activity in one would appear to tend towards a similar condition in the other secondarily, and thus a complete incurable condition of amenorrhœa results, or, in other words, a premature menopause occurs. The question of premature climacteric is of great interest in this connection. The normal menopause may be defined as a phase in female life associated with the cessation of uterine and ovarian functional activity and subsequent atrophy. Usually this is coincident, but not necessarily so, as evidenced by the prolonged periods of flushings, headaches, and molimia, after cessation of the actual uterine discharge. The cause of this normal change is as yet one of nature's unfathomable problems, which, as usual in similar conditions, directs one's thoughts to the equally hidden mysteries of the central nervous system. It must be looked upon, however, as indeed all nature's handiwork is, as desirable and irrevocable. Attempts to delay its accomplishment would be as futile as to stem the flowing tide.

Early or premature menopause, on the other hand, must not, however, be viewed in the light of the inevitable, and accepted with folded hands. Although, doubtless, some of these cases may be due to nervous origin, similar to the normal process, and thus beyond treatment, others must be considered as merely examples of want of functional activity in the ovaries and uterus, which, as has been already shown, can be treated, if desired, with a reasonable hope of success. Here, as has been indicated, the sooner treatment is adopted the more likely is it to be beneficial, as continued inertia tends towards atrophy and secondary changes, which are incurable.

Treatment.—There can be no doubt that in acquired amenorrhœa much may be done in the way of re-establishment of menstruation, as evidenced by the typical cases I have cited.

Uniform success cannot be expected, and repeated failures may have led to treatment being in so many cases unattempted. Further, in many instances it may be open to discussion whether attempts to restore the function are worth while, should the patient describe herself as in good health otherwise. Most women, however, are extremely apprehensive over the absence of their periods, and it is usually poor consolation to assure them of it being a function unnecessary either for life or complete health.

Haphazard treatment is at all times unsatisfactory; cure or failure in one case gives no clue to proceed on with regard to its successor. Until within recent years the galvanic intra-uterine stem was the almost universal treatment adopted, irrespective of the factor in the causation of the disease. The benefits derived by this means were so uncertain, and were obtained at such a risk of peri-uterine inflammation, that it is little wonder that it was generally decided to leave cases alone, and even at the present time there still remains the same disposition among many of the profession. From the medical practitioner's personal point of view, if the patient is otherwise in good health, this attitude is commendable; but should it be the patient's desire, as it so often is, that if possible the function be restored, it is our duty, should there be any reasonable hope of success without any risk to the patient, to treat her accordingly. It is principally with this object, of as far as possible placing the methods adopted on definite lines, that I have brought these observations before you.

Recognising, from what has already been stated, that the condition may be due to defective function of the uterus or ovaries, alone or together, one must as far as possible first determine which organ is primarily at fault. Defective uterine function is usually associated with diminution in the size of the organ, so-called superinvolution, while in ovarian inactivity of not too long standing the uterus remains more or less normal in size. According, therefore, to the size of the uterus, our line of treatment must vary.

Uterine activity can undoubtedly be very forcibly stimulated by a continuous electric current of 40 to 60 milliampères, the negative pole being inserted into the uterine cavity. That elec-

tricity stimulates uterine activity has long been known, and treatment in this direction by the galvanic stem and the faradic current, passed through the lower abdomen, has for many years been adopted. This mode of electrical treatment I have, however, found extremely unsatisfactory, and have consequently abandoned it. On the other hand, with the constant current applied as described, the success I have noted certainly warrants its continued trial.

Where, apparently, ovarian inactivity is the cause of the condition, I have adopted treatment by means of ovarian extract. In these cases the results have been very irregular, but on occasions strikingly successful (see Case VI.).

That ovarian extract has a specific action of a beneficial nature in certain instances, where, after removal of the ovaries, vasomotor irregularities cause marked symptoms, I am quite convinced from observations on many cases. The flushings and headaches, which in those cases are such disagreeable sequelæ to this operation, can frequently be relieved. What the exact physiological effect produced is so far unknown, but it would appear that an analogous agent usually present in ovarian activity is absorbed into the system. We must therefore infer that the active principles of ovarian secretion remain unchanged in the extract, and can thus be administered. That this agent is intimately associated with menstruation is supported by the recurrence of that function in some cases of amenorrhœa, where the extract has been given. Of three cases in which I have successfully treated amenorrhœa by this means, none have subsequently become pregnant; in two of these only menstruation continued after the extract had been stopped. It is doubtful, therefore, whether any recurrence of ovulation was attained. Though the results thus acquired have been but partially successful, they seem to warrant future attempts. Particularly beneficial, however, is the use of ovarian extract in diminished menstruation, where the woman suffers from obesity and symptoms of full-bloodedness. In some instances the flow is markedly increased along with amelioration of symptoms; in others the symptoms are relieved without any appreciable change in the amount of the flow, also in cases where the completion of the climacteric is irregular. When the cessation of menstruation is associated

with similar manifestations of plethora, ovarian extract may often be given with much benefit. The adoption of this method of treatment, even if unsuccessful, has the advantage of the fact that it is entirely harmless—40 grs. daily may be administered without untoward symptoms, while the usual dose necessary is only 15 grs. per diem.

In justification of the treatment on the lines I have described, I may here mention the results I have obtained. In seven cases of acquired amenorrhœa, from apparent uterine cause, three were absolutely successful; menstruation was permanently re-established, and two of these subsequently have borne children. One case was only temporarily cured, the remaining three being complete failures. In seven cases treated by ovarian extract, two were permanently successful, and one temporarily so, in restoring the function; none, however, have become pregnant subsequently. In all the fourteen cases treated, menstruation had been absent over six months. In one of the cases cured by ovarian extract, intra-uterine electrical treatment was also employed.

I have on five occasions extended the treatment to cases of primitive amenorrhœa; in one of these only has success attended my efforts. As this woman, however, was only 21 years old, though married three years, the case cannot be looked upon as of much weight, as it is possible it was merely an example of delayed menstruation.

All the uterine cases treated were married women. So far I have maintained an attitude of entirely refraining from local treatment for amenorrhœa in the unmarried. Whether this attitude, from purely sentimental reasons, is justifiable, may be questionable; but from the uncertainty of results, due probably to our inability to diagnose the true cause of the disorder, I feel the time has not yet arrived when sentiment can be thus rudely set aside.

From what has been attained by the methods adopted in married women, however, I cannot but maintain that cases of so-called superinvolution, or early climacteric, should not be accepted as inevitable and incurable, and treated accordingly with folded hands. Should the patient desire that an attempt be made to restore the lost function, a reasonable chance of

successful treatment may be held out on the lines I have indicated. It might be that by the judicious use of the negative pole, or even ovarian extract, a peerage might owe its direct succession, and the death duties on the family acres reduced to a third. In any case the restoration of a function so dear to the woman of middle life, if it can be attained, is desirable to attempt. In conclusion, I might be allowed to emphasise the following:—

1. That acquired amenorrhœa may be due to functional inactivity of either uterus or ovaries alone, and may in these be treated effectively.

2. That treatment is to be directed along lines indicated by the dimensions of the uterus.

3. That the lines thus indicated are uncertain, from the influences of the central nervous system, which may be the primary cause.

4. That, from the fair amount of success obtained, treatment is justifiable, and should be attempted if the patient so desire.

The discussion on this paper was adjourned.

MEETING VI.—MAY 9, 1900.

Dr R. MILNE MURRAY, *President, in the Chair.*

I. *Professor Simpson* showed (*a*) an ANCEPHALIC FŒTUS; (*b*) a BIPARTITE PLACENTA.

II. *Dr Lackie* showed the BLADDER and KIDNEYS from a case of suppression of urine. The bladder was very much contracted, the right kidney was in a condition of acute catarrhal nephritis with numerous neurotic areas in its substance, the left kidney was replaced entirely by caseous tubercular material. He hoped to read the notes of the case later.

III. *Dr Cullen* showed (*a*) a SLOUGH OF THE CERVIX; (*b*) RADIOGRAPHS OF POLYDACTYLY.

IV. *Dr Foulis* showed a NEW HANDLE to be applied to the ordinary axis traction forceps. He showed that there were objections to the present T-shaped handle in practice, and he thought a perfectly straight handle, which rotated on its own axis, got over these objections completely. Dr Foulis demonstrated how this new handle was an improvement.

V. *The President* showed a SPECIMEN OF CYCLOPS FŒTUS.

VI. Adjourned discussion on *Dr Haultain's* paper on PATHOLOGICAL AMENORRHŒA FROM OTHER THAN CONTRIBUTIONAL CAUSES.

Dr Barbour understood from the title of the paper, which suggested a wider range, that the question was limited to causes in the uterus and ovaries. He thought that amenorrhœa, as regards its treatment, was on a different plan from menorrhagic and dysmenorrhœa. Loss of blood and pain were both directly injurious, while amenorrhœa was only significant as an indication of some other lesion. When the uterus or ovaries were becoming atrophied, it was natural that menstruation be scanty, and in these cases it was sufficient to explain to the patient that the scanty flow was to be expected. He had tried ovarian extract in three cases, with no result as to the amenorrhœa, though the patients said they felt better. In such cases, it was difficult to exclude the physical effect of taking a special drug.

Dr Aitchison Robertson begged to thank Dr Haultain for introducing, to him at anyrate, a new method of treating those climacteric troubles which medical men were so frequently called upon to relieve. He stated that some two years ago Dr Haultain had asked him to try the effect of ovarian substance in cases of anæmia or chlorosis, in order to find, if possible, if there were any relation between the hæmogenic and ovarian functions. Dr Robertson carried out this treatment by ovarian substance in eight cases of simple anæmia or mild chlorosis in young females. Most of these cases were kept in bed for periods varying from two to four weeks, and given from three to six tabloids daily. A careful enumeration of both the red and white corpuscles of the blood and the amount of

hæmoglobin present, were made each week before and after this treatment, but in no case was the result satisfactory. The blood did not gain to any appreciable extent either in corpuscular elements or in hæmoglobin. When these patients were, however, put on either a protosalt of iron alone or in combination with arsenic, a rapid improvement ensued. Dr Robertson, while relating this experience, did not think that any definite conclusions could be drawn from so limited a trial as he had given the drug, but felt sure that in suitable cases such as these which Dr Haultain had related, it would prove of great value.

Having glanced through Dr Haultain's paper, *Dr Foulis* noticed that Dr Haultain had said nothing about the great value of iodide of potassium in the treatment of amenorrhœa. As to the many causes of amenorrhœa, it was impossible to ignore the subject of anæmia, as the whole question was one of quantity and quality of blood, and the causes which prevented the monthly escape of blood. He could give many instances in which iodide of potassium had brought on the menstrual flow after other drugs had failed. Not very long ago he saw a newly married lady in an asylum. She had not been "unwell" for some months, and at first it was thought she was pregnant; but such was not the case. She was violent and suicidal. A few dozes of potassium iodide, three grains twice daily before food, quickly brought on the menstrual flow, and at once the mental condition became normal, and she left the asylum in perfect health, and has remained well ever since. A few days ago a lady consulted Dr Foulis about a full-blooded girl of seventeen, who had not been "unwell" for several months, and it was a question whether she should return to school in such a condition. A single doze of three grains of iodide of potassium brought on the "period"; and the girl is now at school in perfect health. These are only one or two out of many similar cases Dr Foulis has had during the last twenty years. Indeed, when the treatment of large dozes of iron and arsenic after food, with potassium iodide before food, fails, Dr Foulis is then inclined to let the case alone.

Dr Haig Ferguson expressed his high appreciation of Dr Haultain's very original and suggestive paper, which he had

listened to with great pleasure and interest. The paper opened up an almost endless field for discussion, and it was impossible to take up all the points which it suggested. Dr Ferguson would only venture to say a few words, by way of criticism, on one or two things which struck him in the paper. The impression he carried away was, that Dr Haultain laid too much stress on the uterus and ovaries as being the only or chief factors of menstruation, whereas, besides having the uterus, vagina, ovaries, and tubes, normal in anatomy and function, one must have healthy blood, and healthy nerves (especially the vaso-motor), with proper anabolisus, in order that menstruation should be satisfactory. Dr Haultain also, indirectly somewhat, begged the question as regards the relation of menstruation to ovulation, which are of course quite independent processes. One can, however, understand that stimulation of the ovaries, by the administration of ovarian extract, might induce menstruation as the result possibly of the ovulation which it may induce; and it is interesting to hear that stimulation of a small uterus by electricity may bring on menstruation, and thus by improving the tone of the uterus, fit it for pregnancy. In relation to the tendency to adiposity in some cases of amenorrhœa, one has to remember that women in the fertile period of their life are naturally anabolic, and that menstruation is the means by which (when pregnancy does not occur) the excess of anabolism is got rid of each month, menstruation being probably a missed pregnancy. An anabolic woman would therefore tend to get fat if she does not menstruate, and as in Case VII., quoted by Dr Haultain, the stimulation induced by the action of the ovarian extract quickly enabled her to get rid of this excess of anabolic material. It is possible, and indeed probable, that some women are katabolic (like men), when they neither menstruate nor tend to become adipose, and where, therefore, ovarian extract will have no effect in promoting menstruation.

Though imperfect uterine development is often associated with primary amenorrhœa, yet there are many cases of *slight* imperfect development which cause dysmenorrhœa and spamenorrhœa. It is on the whole better to let a woman remain amenorrhœic, than to stimulate an undeveloped uterus to scanty painful menstruation, for in such cases pregnancy (the best cure

for the dysmenorrhœa of ill-development) is not very likely to take place. Dr Haultain's suggestion of electricity may possibly, however, do well in such cases.

Dr Ferguson believed that emmenagogues (so-called) act by increasing and stimulating the pelvic circulation. He had found both ovarian extract and didymin of considerable value, not so much in restoring menstruation as in relieving nervous symptoms, consequent on, or associated with, amenorrhœa from various causes.

Dr Ferguson mentioned the case of a lady, otherwise in perfect health, who only menstruates twice a year at irregular times, and whose mother and grandmother had the same peculiarity. This lady had a normal uterus and ovaries, and became pregnant about five years after marriage. She belongs probably to the class whose anabolic processes are slow, and who take longer time than the average to accumulate the necessary material which will allow of menstruation.

In conclusion Dr Ferguson referred to the curious fact, of which he had seen some instances, that in cases of vesico-vaginal fistula amenorrhœa was the rule, and that when the fistula was closed menstruation became re-established.

Dr Ferguson preferred to call the so-called amenorrhœa of atresia, cryptomenorrhœa, which seemed to him a more correct term.

Dr James Ritchie said that he would confine his remarks to acquired amenorrhœa. He agreed with Dr Haultain in attaching great importance to the influence of the nervous system. He noticed a very great difference in the physical condition of women who had amenorrhœa: frequently a very debilitated woman has her periods regularly, and in like manner a very anæmic girl may be regular, whereas others not so markedly debilitated or anæmic have them arrested. He believed that the cause of the difference must be sought for in the nervous system, and that in those cases which are classed as amenorrhœa due to some constitutional condition, such as anæmia, as well as those more specially referred to by Dr Haultain, the nervous system is involved; consequently in the treatment of all cases of amenorrhœa, he thought that the condition of the nervous system should be kept prominently in view, and treated if neces-

sary. In such cases he found arsenic useful, also manganese in the form of the precipitated oxide. He had treated a few cases with ovarian extract, with apparent benefit. One, a young woman, who had periods only at long intervals, and who had taken both iron and arsenic without inducing the flow, the periods came on after using ovarian extract. The dose which he used in such cases was five grains daily, in some cases half of that dose.

Dr Haultain thought the vexed question of menstruation should first be considered before he ventured on a reply to the question asked. As he had stated in his paper, menstruation owed its origin to the development of both ovaries and uterus.

Coincident with, and probably due to the ovarian maturity and activity, the blood secreting glands become more active, and an extra supply of blood was forced, which doubtless was intended to supply the wants of the development of the fertilised ovum, should such be present. In its absence, however, the excess of blood was removed by menstruation. The menstrual flow might therefore be considered, more or less, to have a safety valve action. He admitted it had probably other beneficial effects, such as rawing the uterine mucosa for the implantation of the ovum, etc. If menstruation be looked upon as a safety valve, it gave a practical reason for its stoppage in anæmia and lactation. It was only natural in anæmia that the flow should stop, as there was not sufficient blood in the individual for her own uses, hence no surplus to be cast off in menstruation. He went so far as to consider that anæmic girls who menstruated really suffered from menorrhagia, and doubtless in many cases the menorrhagia was the cause of their anæmia.

Dr Barbour had reiterated what he had already said, that so far as the doctor was concerned, the re-establishment of menstruation, after a so-called premature menopause, was a doubtful advantage. But it was the patient that had to be considered, and menstruation usually meant a great deal to them. Dr Ferguson had not, he thought, considered the uterine origin of the amenorrhœa, uterine cause; the so-called super-involution, was perhaps more common than the ovarian.

He agreed with Dr Fordyce that the essential characteristics of thyroid and ovarian active principles, were very closely allied,

and offered a field for interesting research. Dr Robertson's experiments were extremely interesting; they evidently showed that the stimulating qualities of ovarian tissues on the blood-forming glands were not present in the medicinal extracts. He thanked the Fellows of the Society for their kindly and valuable criticism on a paper which he knew offered but too much scope for theory. His main object for bringing the subject forward was to show that in certain cases something might be done to restore a function so dear to the women of middle life, which was so often treated by a shake of the head and folding of the hands.

VII.—VAPORISATION (ATMOKAUSIS) OF THE ENDOMETRIUM.

By A. R. Simpson, M.D., F.R.C.P.Ed., Professor of Midwifery and Diseases of Women and Children in the University of Edinburgh.

In the *Centralblatt für Gynækologie* for January 19, 1895, Dr Neugebauer of Warsaw gave preliminary notice of a Russian paper by Professor Sneguireff of Moscow, who had for some years previously been making observations on the effect of steam as a hæmostatic. It had proved serviceable in various hæmorrhages, but the application that to a gynæcologist was specially interesting was the use of it for arresting uterine hæmorrhage and modifying the character of the uterine mucosa. It was stated that the vaporisation of the endometrium has an action at once caustic, hæmostatic, anæsthetic, and antiseptic. The remembrance of this notice was among the elements that made me desirous of visiting Moscow on the occasion of the XII. International Medical Congress in 1897. There I had the satisfaction of hearing Professor Sneguireff's exposition of his invention; and, impressed with the value of it, I was about to procure the apparatus, when the Professor generously offered to send it after me to Edinburgh. It consists of a kettle for generating the steam, and a double catheter for conveying the hot vapour into and out of the uterine cavity. The central tube carries in the steam, which applies itself to the endometrium and escapes through the outer tube that has a series of fenestrations in its intra-uterine extremity.

I shall refer presently to the cases in which I have made use of this instrument. Meantime let me indicate the important service Dr Ludwig Pincus of Danzig has rendered to the profession in popularising the procedure, testing its applicability in a variety of cases, studying the conditions under which it may be employed with most safety and certainty, and modifying the apparatus in some more or less important directions. He applies to the operation the designation Atmokausis (ἀτμός = steam). The instrument he calls the Atmokauter. These terms are being widely accepted. In some cases he uses a non-fenestrated catheter in which the steam heat is applied to the interior of the uterus through the wall of the outer tube, the steam not being allowed to escape into the cavity of the uterus. This steam-hot catheter he calls the Zestokauter (ἡ ζεστότης = boiling heat), and the operation Zestokausis. He has written various papers in the *Centralblatt für Gynækologie* and elsewhere, and the Transactions of some Societies and Congresses contain records of his enthusiasm and industry. Two lectures by him in Volkmann's *Sammlung Klinischer Vorträge*, Nos. 238 and 261-2, for March and December 1897 respectively, contain the fullest exposition of his experiences, and furnish very complete reference to the literature of the subject. It will give the clearest idea of what may be expected from the employment of Sneguireff's Vaporiser in gynæcological practice if I quote the propositions which Pincus has formulated in the last of these addresses which was delivered before the Obstetrico-Gynæcological section of the 71st Versammlung Deutscher Naturforscher and Aertzte München, in September 1899.

"1. Atmokausis and also Zestokausis are both effective and serviceable therapeutic methods. They are not more dangerous than other intra-uterine procedures if the technique is fairly understood, and the prescribed rules carefully followed. Any possible dangers stand in no relation to the good it effects. No one can decline the responsibility of testing and appreciating the methods. The question of their necessity is to be answered affirmatively.

"2. The technique of the procedure may be considered as settled. It regards in the first and only place the demands

and needs of practice. The method has been developed to a typical method of cure.

"3. The best results are obtained when the method is applied in a typical manner, *i.e.*, without narcosis; apart from curetting; with dilatation and protection of the cervix; strict individualisation; rest in bed till separation of the slough—in slight cases from the third to the fourth day.

"4. A dosage of the cauterisation from a superficial effect to the most complete destruction of the mucous membrane is throughout absolutely possible. The dosage depends on the height of the temperature (steam tension), and the consistence (contractility) of the uterus. The higher temperatures from 110-115° C. are to be preferred, because in that case the influence even of the shorter application is the same. The principle holds good—shortest possible duration, highest possible temperature (maximum 115° C.). Especially in young women, and again especially after abortion, one ought to employ the shortest duration. Rather repeat the application, if necessary, after regeneration of the mucosa (about four weeks), or wait recurrence of next menstruation. This precaution is necessary till one attains certainty in judging of a concrete case, *i.e.*, till one is quite accustomed to the use of the method.

"5. Both procedures may replace or supplement curettage. They are quite indispensable when the curette fails.

"6. The method presents a specific against uterine hæmorrhages from whatever cause (menorrhagia, metrorrhagia, climax, myoma), and produces good and rapid results in all forms of endometritis, metritis, and subinvolution.

"7. Obliteration ought only to be sought for to prevent the necessity of total extirpation, never for prevention of cancer of the uterus or from other indications. In any case the indicatio vitalis should be given, for cases are known in which the consequences of obliteration have necessitated total extirpation and castration.

"8. Where the atmokausis fails or produces only transitory effect, the contractile elements of that uterus have been quite lost.

"9. Atmokausis in inoperable intra-uterine cancer is the best palliative yet known. It has also proved serviceable for

disinfection of the cavity of the uterus immediately before total extirpation, and abdominal operations.

"10. In puerperal sepsis (abortion and full time) it produces excellent results in the early stage. In severe general infection it is useless.

"11. Submucous myomata (polypi) and malignant neoplasms, when these have been proved by miscroscopical examination or by the touch, must be excluded from this treatment.

"12. A condition *sine quâ non* for the application is absolute freedom of the adnexa. Whether it is applicable in gonorrheic and other acute processes of the uterus is uncertain."

Dr Barclay, Buchanan Scholar, has looked up the records of fourteen cases, in which we have used Sneguireff's Vaporiser in the treatment of uterine disease, in the Buchanan Ward of the Royal Infirmary. They were all cases of more or less pronounced endometritis with menorrhagia or metrorrhagia, in women varying in age from thirty to forty-five. The vaporisation was always carried out under chloroform narcosis, because the instrument was used in the presence of members of the clinical class, and the application was continued in some for forty-five seconds, in others for sixty, and in one for ninety seconds. One patient alone complained of any suffering. It had been applied for sixty seconds, and it is noted that for some hours after she had uterine pain, which, however, passed off, and she was dismissed cured. The records bear that of the fourteen cases eleven were cured, and the remaining three were improved.

My experience accordingly, does not permit me to accept off-hand all the statements of Dr Pincus; but in the main I must regard them as well grounded. I agree with him, *e.g.*, in suspecting misapplications of the procedure in cases of misadventure. The case of v. Guérard (*Centralblatt für Gynækologie*, xxiii. 1081, Sept. 1899) can hardly stand to the discredit of vaporisation. Subjected at the age of thirty-one to ventrofixation of the uterus for sacral pain, headache, and general discomfort, the patient aborted in January 1890, at the fifth month. The labour was tedious and difficult, and followed by long weakening hæmorrhages, for which atmo-

kausis was applied in April. This was followed by amenorrhœa and such insufferable pains at what corresponded to menstrual epochs, that an attempt was made at vaginal hysterectomy. The strong, very vascular, adhesions of uterus to abdominal wall made it needful to attack it by a laparotomy, which allowed of removal of uterus and adnexa only with the greatest difficulty. The adnexa on each side had been converted into inflammatory tumours the size of a small child's fist. From such a case no conclusion can be drawn as to the value of any kind of operative intervention. It shows, however, that such a destructive effect may be produced, as to lead to complete atrophy of the endometrium—an effect which is sometimes desirable, and which can with care easily be avoided in treating women under forty years of age, who have not yet finished their reproductive career. One of the most interesting results I met with, was in the case of a ward-maid in the Royal Infirmary, in whom two years previously diseased ovaries had been removed. She had for a time been amenorrhœic, but irregular metrorrhagic discharges occurred, which led us to consider the necessity of vaginal hysterectomy. It was decided, however, first to make trial of the atmokauter, with the result that the hæmorrhages ceased and atrophy of the uterus set in.

Another drawback that has been charged to the procedure is the possible production of a stenosis or atresia of the cervix. Against this contingency, Pincus provides by having the catheters covered with celluvert. I have found no difficulty in using the original Sneguireff instrument covered according to Dührssen's suggestion (*Centralblatt für Gynækologie*, 18th March 1899), with a piece of india-rubber tubing.

The germicidal power claimed for the steaming of the uterus must be doubted, if not discarded, in view of the experiments of Flatau (*Monatsschrift für Geburtshülfe*, x. 337, 1899), who finds that it takes a minute before the temperature rises to 75-80° C., and that the available heat even after the sixty seconds is only from 75-85° C. Flatau, however, recognises the value of the procedure, especially in cases of preclimacteric hæmorrhages and of interstitial endometritis.

All are agreed that it is important to take note of the

condition of the uterine walls, the best results being obtained where these are firm with good power of muscular contraction; and the only really disastrous accident that has been recorded having occurred in Treub's Klinik in Amsterdam (*Centralblatt für Gynækologie*, No. 52, 1898), in a case of soft-walled uterus where the fundus was perforated by means of the zesto-kauter.

It will have been observed that Pincus lays stress on the application of the vapour without bringing the patient under the influence of an anæsthetic, chiefly on the ground that when the steam has produced its effect on the mucosa the muscular walls begin to be irritated and painful contractions usually arise which give a signal that the current should be turned off. He not only applies the procedure to non-narcotised patients, but considers it safe to use it in ambulants. He recommends, however, that when a patient has been atmokauterised at a poliklinik or a consulting-room, she should be made to go to bed and rest for three or four days or until the slough separates. In all the cases in which I have employed the instrument, the patients, as I have stated, were anæsthetised and kept at rest for two or three weeks. There has been no untoward effect, even though in some of the cases there were traces of old-standing salpingo-ovaritis.

In America, Dr Brothers of New York (*American Journal of Obstetrics*, xl. 498, 1899) has published his encouraging experiences with intra-uterine vaporisation, but I have not observed that British journals have as yet shown an interest in the subject. It is, however, well worthy of more study than has been accorded to it, and I am convinced that wider experience will only go to confirm the impression that this intra-uterine vaporisation or atmokausis will retain a permanent place among the curative measures at the disposal of the gynæcologists.

It should be added that Professor Sneguireff has also employed steam for the arrest of some forms of surgical hæmorrhage, as, *e.g.*, in operating on the liver, with satisfactory results. He has shown that bleeding wounds that were steamed heal by the first intention, and his apparatus contains a tube for application of steam to wound surfaces in

general. Of such atmokausis, however, I have no experience.

VIII. CLINICAL NOTE ON A CASE OF VULVAR HÆMATOMA.

By J. W. Ballantyne, M.D., F.R.C.P. Ed., F.R.S. Ed., Lecturer on Midwifery and Gynæcology in the Medical College for Women, Edinburgh.

Cases of vulvar hæmatoma are sufficiently uncommon and sufficiently diversified to warrant recording in the Transactions of our Society. The case to be described occurred in connection with the midwifery department of the Western Dispensary, Edinburgh.

On November 29, 1899, at half-past five P.M., a message reached me from one of the Western Dispensary pupils, stating that a swelling had suddenly developed in the left labium of a parturient patient whom he was attending. The message had been sent off about 5.15, and, as I found out later, the vulvar swelling had then only just begun to form. I was in attendance at 5.45, and the tumour had then attained a size nearly equal to that of a fœtal head; so that in the space of not more than forty-five or fifty minutes the hæmatoma (for that was evidently its nature) had grown to very considerable dimensions. The patient was a primipara, aged twenty years and nine months; she was a domestic servant, but having become illegitimately pregnant she had returned to her mother's house, where she was now being confined. As I afterwards discovered, her pregnancy had progressed normally and without incident, and she had not shown any degree of pendulous abdomen (a condition to which Halliday Croom[1] is inclined to attribute etiological importance in connection with the vaginal variety of hæmatoma). She calculated that she was at the full term of gestation. Labour had commenced in the morning of the 29th, and the first stage had lasted about nine hours. The membranes had ruptured a short time before I was sent for. The student in attendance had noticed no special varicose veins in the labia, and the first stage of labour had been in no

[1] Croom, J. Halliday, *Trans. Edinb. Obst. Soc.*, xi. p. 80, 1886.

way abnormal. With the beginning of the second stage, however, the patient began to complain of sharp pain in the left side of the genitals; and about a few minutes after five o'clock, the swelling in the left labium majus had commenced to show itself.

I found on my arrival that the student in attendance, becoming alarmed by the rapid growth of the labial swelling, had sent out in haste for a neighbouring medical practitioner (Dr Richardson). He was present and kindly gave me his help and advice during the time occupied in delivering the woman. A glance at the patient showed that she had lost much blood, and it was at the same time noticed that there was some œdema below the eyes; she was complaining greatly of pain in the left labium majus. Inspection of the external genitals revealed a tense swelling in the position of the left labium, bluish black in colour, of the size of the closed fist, and extending for a short distance into the vaginal canal. The skin covering it seemed distended almost to bursting, and palpation did not detect any pulsation in the mass, which was partly solid and partly fluid; there was an obscure sense of fluctuation at one part. The vaginal examination discovered the fœtal head engaged in the pelvic inlet, lying on the O.L.A. position, well flexed; no contraction of the brim could be detected. The diagnosis could not be in doubt—the condition was that of vulvar hæmatoma or thrombus developing during the second stage of labour—the treatment, however, was not so evident. Since the hæmatoma was rapidly increasing in size (it was literally visibly growing), it was clear that there was no time to be lost; and the case resolved itself into the choice of operative interference, for it was evidently out of the question to leave it alone. As the blood tumour was actively increasing I hesitated to make an incision into it. On the other hand, I doubted whether I could apply forceps to the head without rupturing the hæmatoma. I decided to try forceps application. With considerable difficulty I got the blades in position, and easily brought the head on to the perineum. At the moment when I was making the head distend and pass over the perineum, the tumour bulged into the fenestra of one of the blades and

ruptured almost with a clean cut tear. A huge mass of blood clot was expelled along with some fluid blood and serum. I quickly thereafter delivered the head and body of the infant, which was a large male in a state of apnœa; it was soon resuscitated and is living at the present time (age, five months). It was not an abnormally large infant, neither was its head preternaturally well ossified. The placenta and membranes were removed manually from the vagina, and by this time the hæmorrhage from the hæmatoma had almost entirely ceased. Notwithstanding the escape of the large clot, the left labium was still somewhat larger than normal, the tissues seeming to be infiltrated with blood. The parts were carefully washed with weak perchloride of mercury solution, and I attempted to bring together the edges of the tear by means of silk-worm gut sutures (four or five in number). On account of the thickened condition of the labium, the wound could not be entirely closed; it gaped at the middle, so I had to content myself with loosely packing in iodoform gauze as a drain there. Some strips of gauze were also placed loosely in the vaginal canal, not with the purpose of plugging it, but simply to prevent, if possible, the infection of the wound. Iodoform powder was dusted copiously over the surface of the labium. The patient naturally enough was somewhat collapsed. She made, however, a perfectly satisfactory recovery: her temperature never rose above 100° F.; the wound was dressed twice daily; and in three weeks she was up and about. Now, five months after the confinement, the labium majus has returned to its normal size, and there is nothing to indicate that it was ever the seat of a large hæmatoma. It may be added that a trace of albumen was found in the urine during the first few days of the puerperium; this disappeared under strict milk diet, as did the œdema under the eyes referred to above.

Remarks.—The case just narrated forms a very characteristic instance of one variety of thrombus or hæmatoma complicating labour; that, namely, in which the blood escapes into the tissues of one or other, or both labia, and to some extent into the vaginal wall also. It is rarer to find the thrombus entirely in the vagina, and rarer still to meet with the intra-

pelvic variety; a most exceptional form is the pedunculated and superficial vaginal hæmatoma. It occurred during the second stage of labour, but statistics show that a thrombus most commonly forms during the puerperium, less frequently during the second stage of labour, and very rarely during either the first stage or in pregnancy. It showed very clearly the three leading symptoms, pain, swelling, and hæmorrhage; the pain was sharp, and was situated in the position occupied by the tumour, which was large, but not so large as has been reported on some few occasions; and the hæmorrhage was first of all interstitial into the substance of the left labium majus, and later external on account of rupture of the skin covering the labium. The rapidity of formation of the blood tumour was very noteworthy, and this is a commonly observed character of thrombus of the vulva. Fortunately the symptomatology did not include infection of the sac after rupture, and septicæmia was avoided. The diagnosis was easy, and it is only in the vaginal and intra-pelvic varieties that any difficulty in this matter is likely to occur. The treatment was not entirely satisfactory, and doubtless I would have been well advised had I incised the thrombus either before or during the application and employment of the forceps, for then I should have had a clean incision to bring together with sutures, and I could have made it at the point of election for drainage. At the same time I had hopes that I might have drawn the head over the perineum without rupturing the hæmatoma. After rupture had occurred, evidently the treatment resolved itself into prevention of infection of the cavity in the labium by the lochia, and fortunately this was successfully accomplished.

The *etiology* of the hæmatoma in this instance, as indeed in most instances, is most obscure. Most of the commonly alleged causes, such as traumatism, twin-labour, large fœtus, excessive ossification of the fœtal head, and unusual varicosity of the labial and vaginal veins, were conspicuous by their absence. There was, further, no reason to suspect the presence of a hæmophilic tendency in the patient, and the pelvic brim was very slightly, if at all, contracted. It has already been noted that there was no pendulous abdomen during pregnancy. Doubtless there existed the usual congestive tendency in the

pelvic tissues, and the same changes in the maternal blood which are constantly met with in pregnant women, and which have by some been regarded as causes of vulvar hæmatoma in labour and the puerperium; but it is not reasonable to ascribe an etiological importance to these *constant* conditions, in attempting to explain the origin of so *rare* a morbid state as vulvar thrombus. The most that can be said is, that under some quite exceptional combination of circumstances, the congestion of pregnancy and the accompanying hydræmia may act as causes predisposing to hæmorrhage. In the case just narrated it is possible that one of the combined circumstances that determined the effusion of blood, was the albuminuria, for it will be remembered that after labour was over, a small quantity of albumen was found in the urine (drawn off by catheter), and there was also the transient œdema of the face. It is evident that in searching for the causes of a complication of labour and the puerperium, which occurs but once in from 1500 to 1600 confinements, it is necessary to look for either one very exceptional circumstance, or for a very unusual combination of less exceptional circumstances. Neither primiparity nor the pressure of the fœtal head on the congested maternal passages can be regarded as exceptional circumstances. All that it seems safe to state regarding the etiology of the case which I have described is, that the strain of labour, no doubt, determined the hæmatoma which had been predisposed to, possibly by the transient nephritis. It is interesting in this connection, to note that in a recently reported case of hæmatoma vulvæ, occurring some hours after labour in a ii.-para, H. Löhlein [1] discovered that there had been chronic nephritis in the pregnancy, and was inclined to attribute the hæmorrhage to that disease (*causa disponens*).

The pathogenesis of the hæmorrhage into the labia is no less obscure than the etiology. In the case just narrated no explanation can be hazarded, for the patient recovered, and there was happily no occasion for a necropsy. It has, however, been found (in a specimen examined by Perret [2]) that a

[1] Löhlein, H., "Zur Entstehung und Behandlung des Hæmatoma Vulvæ der Neuentbundenen," *Centralbl. f. Gynäk.*, xxi. 267, 1897.

[2] Tarnier, S. et Budin, P., *Traité des accouchements*, iii. 667, 1898.

sliding or displacement of the layers of tissues in the pelvis, and more especially in the vaginal walls, has taken place, and that into the space thus produced the blood has been poured. In one case the hæmatoma was found on one side of the pelvis, while on the opposite side was a cavity capable of holding a hen's egg, but empty; it was supposed that this cavity was destined to be the receptacle of the outpoured blood, and that in fact the space into which the blood was to be effused was formed before the hæmorrhage took place. With the soft parts *in situ*, it must be remembered that the pelvic canal is wide above and narrow below, and that as the fœtal head is pressed downwards into it, it is not unlikely that the soft parts may be displaced downwards in front of it, thus producing a separation of the strata or layers which make up the vaginal walls and their immediate surroundings; into the space thus produced, blood may be poured either in labour (producing hæmatoma in the second stage), or soon afterwards in the puerperium (Budin).

MEETING VII.—JUNE 13, 1900.

DR R. MILNE MURRAY, *President, in the Chair.*

I. The Society agreed to the following recommendation by the Council: "That the Society should agree to subscribe five guineas a year, for three years, to the Royal Medical Benevolent College." The Society also agreed to the following motion made by the Council: "That each writer of a paper must supply a short abstract of his paper, at least ten days before the meeting at which it is to be read, so that it may be printed and issued with the billet for that meeting."

II. *Dr Brewis* showed (*a*) UTERUS removed by hysterectomy (sub-peritoneal) after Cæsarian section at term. The case is described in the Society's Transactions. (*b*) GRAVID UTERUS removed by pan-hysterectomy at the fifth month for cancer of

the cervix. (*c*) UTERUS removed by vaginal hysterectomy for cancer of cervix and body. (*d*) PYOSALPINX removed by vaginal section.

III. *Dr Haultain* showed (*a*) a RUPTURED EXTRA-UTERINE GESTATION SAC AND FŒTUS which had escaped into the peritoneal cavity. The pregnancy had continued to the fourteenth week, and was interesting in so far as there had been no irregular hæmorrhages, the only indication of the abnormal condition to be derived from the history before rupture took place was a severe constant pain in the side for a fortnight previously. Eight hours after the operation, which was easily and successfully performed, the patient nearly bled to death during the expulsion of her uterine decidua, vaginal plugging had to be had recourse to, to prevent further bleeding. This forms a hitherto undescribed variety of post-partum hæmorrhage. (*b*) A BLOOD CYST from the canal of Nuck. The cyst, which was the size of a walnut, was removed from a woman four weeks after her confinement. It formed an extremely hard nodule in her right labium, and was growing so rapidly that malignancy was feared, and prompt extirpation undertaken. It probably represented a similar condition to the so-called hydrocœle mulrebris described by Majewski, the contents however were sanguineous not serous. (*c*) A FIBRO-ADENOMA of the vagina removed from a patient forty-five years of age. The growth was the size of a Tangerine orange and grew on the anterior vaginal wall, bulging through the vulva like a cystocœle. Before operation it was thought that though sessile it would be easily enucleated, this, however, was not so, as there was no capsule, and the tumour had to be dissected from the urethra and anterior vaginal wall. Since removal there has been no return, and the incontinence of urine from which the patient suffered has much improved. The character of the growth is extremely interesting, and so far as can be seen, is unique. Where the glandular tissue arose from is difficult to account for, the glands were lined by ciliated cylindrical epithelium. It is possible that Gaertner's duct may have been the original source. (*d*) A SMALL SIMPLE OVARIAN CYSTOMA which, though only 5 lbs. in weight, was associated with $5\frac{3}{4}$ gallons of ascitic

fluid. The patient from whom it was removed was fifty-two years old, and gave the history of having noticed the swelling for about a year, but during the last two months the abdominal distension had been most rapid. Her uterus was prolapsed between her thighs. On exploratory incision the above stated large quantity of fluid was evacuated, and the small ovarian cyst found. The uterus was stitched into the pelvis by shortening the infundibulo pelvic ligaments, and also ventro-fixating the fundus. There has been no return of the ascites. The tumour on section proved to be a simple adenomatous cyst, no papillomatous wens or signs of malignancy were evident anywhere.

IV. *Dr J. W. Ballantyne* exhibited (*a*) FROZEN SECTIONS AND PHOTOGRAPHS of a specimen of fœtal iniencephaly, which had been given to him for examination by Dr W. Fordyce. The mother of the fœtus was thirty-five years of age, a vi.-para, and gave birth prematurely in the eighth month of pregnancy. During the last two months there was enormous abdominal distension, which was found at the time of labour to be due to hydramnios, there being at least four gallons of liquor amnii. The fœtus, a female, weighed 1470 grammes, and measured 21 cms. in length. It was typically iniencephalic; there was marked retroflexion of the spine, defect of the occiput in the neighbourhood of the foramen magnum allowing part of the brain to lie on the vertebral bodies of the open spinal canal, and absence of the neck groove both before and behind. There was also defect of the diaphragm, with displacement of the intestines into the thoracic cavity. (*b*) A UROMELIC SYMPODIAL FŒTUS, which he hoped to bring again before the Society in its dissected state. It had been sent to him for report by Dr J. Howard Jones of Newport, Monmouthshire, and in addition to the sympodia showed double hare-lip, and double club hand, with absence of the radii. There was no external indication of the sex, and no trace of an anal opening. (*c*) A KNOT ON THE UMBILICAL CORD, which Dr R. A. Lundie had given him. It came from a patient, a multipara, who in the last weeks of pregnancy had suffered much from excessive fœtal movements. The quantity of liquor amnii had not been so much as to

warrant the use of the term hydramnios. At the time of labour it was found that the fœtus would not engage in the pelvic inlet; forceps were tried but no hold of the head could be got, and Dr Lundie therefore turned and delivered. The child, a female, was alive. The knot which was situated nearer the fœtal than the placental insertion of the cord was a simple one. The length of the cord was 55 cms., and allowing for the part in the knot and the part still attached to the child it must have been altogether about 65 cms. It showed the usual two arteries and one vein and a normal amount of Whartonian jelly, and was not unusually tortuous. The placental insertion was nearly central. The placenta was nearly central, its diameters being 15 cms. by 17 cms., and its thickness was about 2·5 cms.; the border was a little irregular. The amnion was partly stripped off the fœtal surface. At one point not far from the insertion of the cord, a white spot, measuring about 3 cms. in diameter, was seen lying under the amnion. Sections were made of it for microscopic examination.

V. *Dr Haig Ferguson* showed a DERMOID TUMOUR of the right ovary, containing, *inter alia*, a large coil of hair, which he had removed by abdominal section from a patient in the fourth month of pregnancy. The tumour was densely adherent in the pouch of Douglas, and slightly to the uterus, and it blocked the brim of the pelvis. The patient made a good recovery, and the pregnancy was not interrupted by the operation. During the month the patient was under observation before operation the tumour showed evidence of rapid growth. This is the patient's second pregnancy, and no tumour was detected during her first pregnancy and confinement, about two years ago. The tumour was only discovered accidentally on this occasion, owing to the patient consulting Dr Ferguson in order to know if she was pregnant, as she had not the usual datum of the cessation of menstruation to go by. An interesting point about the patient is that she only menstruates about twice a year, as did also her mother and grandmother before her.

VI. ON THE NOMENCLATURE OF TRANSVERSE PRESENTATION AND OF VERSION, WITH REMARKS ON THE CHOICE OF THE LEG SEIZED.[1]

By D. Berry Hart, M.D., F.R.C.P.Ed., F.R.S.Ed., etc.; Lecturer on Midwifery and Diseases of Women, Surgeons' Hall; Physician, Royal Maternity Hospital; Senior Assistant Gynæcologist, Royal Infirmary, Edinburgh.

Cases of transverse presentation at full time and in labour demand your most careful consideration and prompt treatment, as on your skill will depend both the mother's and child's life. Although such cases have been studied and treated for centuries, we are yet far from having even a good and intelligible nomenclature, especially for the varieties of version, and a division of opinion still exists, for instance, as to which leg is the better for seizure in order to perform this necessary operation accurately. Let me therefore direct your attention to—

1. *The nomenclature of the positions in transverse presentations.*
2. *The nomenclature of the varieties of version.*
3. *The choice of the leg seized.*

1. *The nomenclature of the position in transverse presentation.*—The best nomenclature is that which divides transverse presentation into dorso-anterior and dorso-posterior positions, and each of these again into left acromio-iliac and right acromio-iliac, according as the acromion is to the left or right side.

We thus have—

Dorso-anterior	{ Left acromio-iliac.
	{ Right acromio-iliac.
Dorso-posterior	{ Left acromio-iliac.
	{ Right acromio-iliac.

It is better to name the positions from the acromion, as it

[1] Part of two systematic lectures given at Surgeons' Hall, winter session, 1899-1900.

is the presenting part often, and fits in with the definition of position I have already given you.[1]

It is not so exact to substitute cephalo-iliac for acromio-iliac.

The nomenclature "left scapulo-anterior," and so on, is concise, but little else can be said in its favour. Note, further, that right and left and anterior and posterior always refer to the mother and not to the fœtus, unless expressly stated.

2. *The nomenclature of the varieties of version.*—The present nomenclature is very confusing. You will appreciate this when I say that it leads to indefiniteness in version questions when set in the final professional examination. There may, for example, be room for doubt as to what the examiner wants when he asks for the method of performing podalic version, and this is most perplexing to candidates.

The terms applied to version are either descriptive of the method by which the version is performed or of its aim. Thus podalic version or cephalic version expresses the fact that the aim of the version is to substitute respectively the lower limb or the head for the presenting part. On the other hand, bipolar version, combined external and internal version, or external version, are all terms descriptive of method.

Inasmuch as we usually substitute the lower limb for the presenting part, the forms described by method terms are also podalic. The mere term podalic is thus not definite enough. Another source of confusion is that the internal hand requires to be passed deeply, *i.e.*, above the retraction ring in certain cases, whereas in the bipolar method of Hicks it should not be passed beyond the presenting part, *i.e.*, about the level of the retraction ring. The term combined internal version does not, however, indicate which is meant. To be exact, we must define the varieties of versions, both as to method and aim; or, as we might put it, the definition term of version requires $\frac{\text{method}}{\text{aim}}$.

[1] Position is the relation to the upper strait of the pelvis of that portion of the presenting part which should rotate to the front in internal rotation. In spontaneous evolution, if completed, the shoulder rotates to the front.

Put in this way—

Cephalic version	=	$\frac{\text{Bimanual external manipulation}}{\text{Head.}}$
Bipolar version of Hicks	=	$\frac{\text{One hand external and one internal, but not deep}}{\text{Lower limb.}}$
Combined version of J. Y. Simpson	=	$\frac{\text{Hand external, and hand internal and deep}}{\text{Lower limb.}}$

We must, however, have a more compact terminology, and what I suggest is this. There are three great varieties of version. The first is cephalic version; this is now seldom used in practice, is practically performed by external manipulation, and thus its terminology is seldom needed. We can speak of it, therefore, as cephalic version by combined external manipulation. The old way of performing version was simply to pass the hand into the uterus, seize a foot or both feet, draw down and complete the operation. Sir James Simpson was the first to impress the profession with the importance of also aiding with the external hand. His words are: "We derive the greatest possible aid from manipulating the uterus and infant with the other hand placed *externally* on the surface of the abdomen." It seems to me that it would be advantageous to apply the term "Simpson's combined version" to those cases where the internal hand is passed into the uterine cavity proper to seize a foot, the external hand being also used in the version. This is the method for fixed cases.

It is to Braxton Hicks, however, that we owe the perfecting of version so far as the combined internal and external method is concerned. Barnes undoubtedly helped in this evolution by the valuable description he gave of it in his Obstetric operations.

Hicks' method, where the internal fingers do not pass beyond the presenting part, while the external hand aids the manipulations, usually has the terms Hicks' bipolar version applied to it.

We have thus three clearly defined varieties of version, as follows:—

Combined external—cephalic.
Simpson's combined version—podalic.
Braxton Hicks' bipolar version—podalic.

In the second and third we might for shortness speak of Simpson's podalic and Hicks' podalic. This would practically give method and aim.

3. *The choice of the leg seized.*—Here again Simpson was the first to attract attention by advocating the seizure of the further knee, *i.e.*, of the knee opposite the presenting shoulder. Galabin, on the other hand, advocated the near foot as a rule, while Nagel has given us by far the most complete discussion of that subject. The whole question, however, is not thoroughly threshed out as yet, and I therefore purpose reconsidering it.

What follows, however, applies in the main to cases of transverse presentation, where the liquor amnii has in part drained off and the version rendered difficult. In a simple case one can turn easily whichever leg is taken, and the leg seized will come to the front in the end. In difficult cases, where we need to employ Simpson's combined version, it is, however, of importance to seize the leg which gives the safer operation.

Simpson's paper is of considerable interest, and was written *à propos* of a case of transverse presentation delivered by him at the Edinburgh Maternity in 1845, at least that is the date of the report in the *Edinburgh Monthly*. The position was dorso-posterior, right acromio-iliac.

In this case Simpson seized the further knee and delivered. He apparently delivered the head by the Smellie grip, but the description is not very clear ("two fingers . . . over the neck and introducing two others into its mouth"). Simpson's reason for seizing the further foot was that he wished to rotate the body on a transverse axis as well as on its longitudinal axis. The latter rotation he held must raise the presenting shoulder, *i.e.*, turn the fœtus. His own words are, "By carrying the knee diagonally across . . . the abdomen of the child to the os uteri, we both . . . *flex and rotate* at the same time the trunk of the infant, and in doing so the semi-rotation of the trunk inevitably carries up the presenting arm" (p. 371, "Selected Works," vol. i., 1871). He adds, though not quite logically, that if both knees are drawn down we should merely flex the body, and in

this Barnes agrees with him. It should be noted that this case narrated, a dorso-posterior transverse, is the favourable one for the seizure of the upper knee. Simpson does not discuss the proper seizure in dorso-anterior positions.[1]

The next important paper is by Galabin, of Guy's Hospital. It would be difficult to condense Dr Galabin's concise and very able paper, but his conclusions give the gist of it and are as follows:—

1. The rotation of the fœtus on its antero-posterior axis by means of the lower leg is generally effected at a greater mechanical advantage, and therefore by a less force than the combined rotation on its transverse and longitudinal axis by means of the upper leg; while it is sufficient to produce elevation of the shoulder, unless the fœtus is dead and flaccid or uterine rigidity extreme, and the upper leg may with no diminished advantage be afterwards brought down if required.

2. If the lower leg be taken and a noose placed upon the prolapsed arm, the operator has complete command of the anterior arm in the subsequent extraction.

3. By taking the lower leg the more usual dorso-anterior position is not converted by the version into a dorso-posterior position, a point of very minor importance, but one which may, in some cases, be worthy of consideration.

Galabin, like Simpson, practically considers the seizure of the leg in relation to the feasibility of version, and does not discuss the question of the mechanism of the breech after it is engaged. He states, however, that he has found in dorso-posterior positions where he seized the upper knee that the back remained posterior after the version, and was not converted into a dorso-anterior.

It is also to be noted that Galabin's excellent diagrams represent the fœtus as dorso-anterior, the more favourable

[1] It is of some interest to note that Martin Barry was the house surgeon, and that "during the labour the patient was bled and had an ounce of antimonial wine exhibited in f ʒ doses to promote the dilatability of the cervix uteri. Shortly before turning ʒ i of laudanum was exhibited in order to moderate the uterine contraction and facilitate the process of turning" (p. 364). This was two years before the discovery of chloroform.

position for seizure of the lower leg, and I have already pointed out that Simpson illustrates his view on a dorso-posterior case, which is the more favourable position for the seizure of the further knee.

Nagel's paper is a very able and exhaustive one, and he throws a good deal of additional light on the subject. The point of Nagel's paper is that he does not consider the question of the leg to be seized merely from the point of the accomplishment of version, but indicates that we should seize the leg whose half breech will pass sooner to the symphysis, thus taking the standpoint of the older observers (Baudelocque and Hohl) and of his own master, Gusserow.

I have already stated that Galabin found clinically that in dorso-posterior position the back was still posterior after version, but Nagel notes that in nineteen cases of dorso-posterior, or where he seized the further leg, each became dorso-anterior after version.

It is quite true, however, that when the breech is low the seizure of the further leg in dorso-posterior may allow the back to remain posterior after version. When, also in dorso-anterior cases, the breech is in the fundus, one may, owing to the necessary want of obliquity in the traction, convert a dorso-anterior into a dorso-posterior. Let us now discuss each position, given the leg seized.

In the dorso-anterior left acromio-iliac, if the near foot be seized the fœtus will remain dorso-anterior, and the half breech of the limb pulled on rotate through quarter of a circle to the front; there will be thus slight rotation of the trunk and little difficulty with the arms.

If, however, in this same position one seized the further leg, the position would become dorso-posterior; one would get a long rotation of the breach and risk of disturbance of arms. This long rotation is made up of a first part, where the breech accommodates itself to the transverse of the brim; and a second portion, the ordinary internal rotation.

What I have just said for the dorso-anterior left acromio-iliac holds for the dorso-anterior right acromio-iliac.

In the dorso-posterior left acromio-iliac, the further leg when drawn down will convert the primitive position into a

dorso-anterior with subsequent short rotation of the breach; while if the nearer foot be taken, we get the primitive position remaining posterior, with consequent long rotation. We may therefore put the rule for seizure of a knee or leg in transverse cases, where one performs what I have termed Simpson's version, as follows: Seize the knee, or leg, which maintains the dorso-anterior position or converts the dorso-posterior into a dorso-anterior, *i.e.*, take the further limb for dorso-posterior cases, the nearer for dorso-anterior cases. When, however, in dorso-anterior the breech is in the fundus, traction on the nearer leg may convert it into a dorso-posterior; and when the breech is near the os in dorso-posterior, traction on the further leg may not alter the posterior position of the back after version, owing again to the want of the necessary obliquity in the pull.

I may sum up this controversy, therefore, by saying that for dorso-posterior cases Simpson's advice is best, while for dorso-anterior ones, Galabin's plan is right. Each of these observers, therefore, stated half the truth.

Literature.

Cameron's article on "Version," *Am. Syst of Gynæcology and Obstetrics*, vol. i., p. 208.

Galabin—"On the choice of the leg which should be seized in version for presentation of the upper extremity," *Lond. Obst. Tr.*, vol. xix., 1877.

Nagel—"Further Contributions to the Study of Version on one Leg," *Edin. Obst. Tr.*, vol. xviii., 1893.

Simpson, Sir J. Y.—"Transverse Presentations," *Selected Obstetrical and Gynæcological Works*, vol. i., p. 363. A. & C. Black, 1871.

Professor Simpson agreed with the President as to the interest and value of Dr Hart's paper. Especially he thought that Dr Hart had rendered a good service in studying and making clear the conditions in which respectively it was desirable to seize the nearer or more distant limb. The knees were not far apart from each other, and there was not an increase in the danger of introduction of the hand so far as

to reach the further leg at all to be compared with the advantage obtained in effecting the version in the appropriate cases. As to the nomenclature of the positions, he (Professor Simpson) thought that both in teaching students and in dealing with cases it was best to keep in view the relation of the scapula and to name them left or right according as it (and it includes the acromion process) is turned to the mother's left or right side. The left were usually anterior and the right posterior.

Dr Barbour and *Dr M'Vie* also made remarks.

Dr Hart replied.

VII. ON THE SET OF THE PELVIS IN THE BODY (VARIATIONS IN THE INCLINATION OF THE BRIM APART FROM POSTURE), AND ITS OBSTETRICAL SIGNIFICANCE.

By A. H. Freeland Barbour, M.D., F.R.C.P.Ed., Physician to the Royal Maternity Hospital, Edinburgh.

My attention was first directed to this subject by the study of the pelvis in cases of spinal deformity. It is a well-ascertained fact that in cases of antero-posterior curvature, there is a great range of variation in the inclination of the brim. If the curvature is low down inclination is diminished, while if it is high up it is increased till the brim becomes almost vertical. This is evident from a glance at Figs. 1 and 2, taken from a series of pelves in the Museum of the Royal College of Surgeons, Edinburgh, which I described in this connection.[1] The reason for this change in inclination is the compensation required for the disturbance in the distribution of the weight of the body. The feature in these pelves, which I wish here to draw attention to, is that this alteration is not a temporary change, but affects the set of the pelvis in the body.

I have taken the liberty of introducing the phrase, "set of the pelvis" (for an anatomical reason which I shall explain later), instead of the term, "inclination of the brim," which has

[1] *Spinal Deformity in Relation to Obstetrics.* W. & A. K. Johnston, Edinburgh and London, 1885.

come to be associated with physiological variations in the positions of the pelvis, which are dependant on posture. Under it lies the tacit assumption that for a given posture the inclination is the same for all pelves.

FIG. 1.—Vertical mesial section of skeleton from a case of dorso-lumbar kyphosis, with diminished inclination of pelvic brim.

FIG. 2.—Vertical mesial section of skeleton from a case of dorsal kyphosis, with increased inclination of the brim, which is almost vertical.

Since I described these specimens another preparation has been added to the Museum of the College of Surgeons, which is of great interest in this connection. It is the skeleton of a woman who died at the age of 31, having spent twenty-nine years of her life in the dorsal posture. It has been described in a paper by Mr Alexis Thomson on "Microcephaly and Infantile Hemiplegia." Through the kindness of the Museum Committee I am enabled to reproduce it here. The patient was an idiot

and suffered from right hemiplegia in infancy. "She never walked, and even when she sat in a chair she tended to fall so much to the right side that a recumbent posture soon became necessary. She remained in this posture from this time (about two years of age) until her death at the age of 31." This, then, is the pelvis of a patient who was always on her back. On looking at it (Fig. 3), we observe many noteworthy features, as

FIG. 3.—Pelvis from a patient, who was in the recumbent posture from the age of two.

for example, the absence of the unilateral contraction characteristic of scoliosis. The one which I wish here to draw attention to is the high set of the brim, associated with which are ilia which stand almost vertical and show scarcely any curvature of the crests.

To bring out the position of the promontory, I have plotted out its relation to the symphysis in a diagram (Fig. 4) similar to those which we shall use in describing other pelves later on. This preparation then shows us a pelvis which has not been subjected to the weight of the body, and its high promontory and almost vertical brim have a special interest in this connection.

These variations in the set of the pelvis in cases of disease lead up to the question whether there is a definite inclination

of the brim for what we are in the habit of describing as the normal pelvis. In a paper which I read before the Society[1] two years ago, I drew attention to the variability in the inclination of the brim as shown by frozen sections from cases of pregnancy and labour. I limited the inquiry to cases of pregnancy and labour, as the weight of the pregnant uterus will modify the inclination of the brim. I also rejected the cadavera which were not frozen in the dorsal posture to eliminate alterations due to posture, and because this is the position assumed in the second stage of labour.

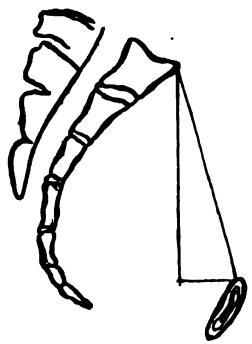


FIG. 4.—Scheme of pelvis given in Fig. 3, to show the inclination of the brim.

In studying the frozen sections which satisfied these conditions, I was struck with the fact that the direction of the brim is not definite, but varies greatly in pelves which might be considered obstetrically normal. To compare the pelvis of one frozen section with another, and the relation of the fœtal head in

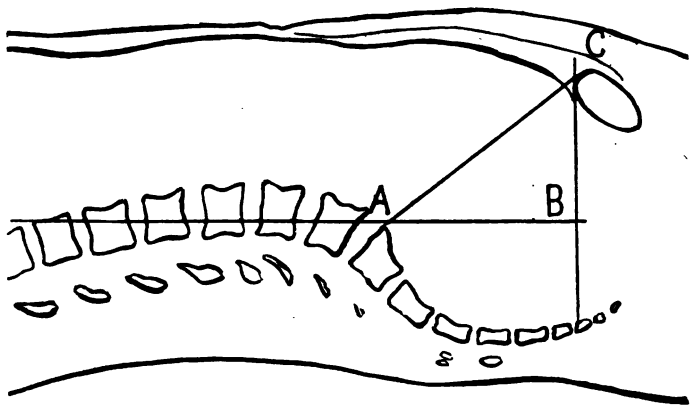


FIG. 5.—Vertical mesial section, showing inclination of the brim most usually found in frozen sections made in the dorsal posture. The brim *A C* is inclined 55° to the long axis of the abdomen, *B A*.

each, I have made use of tracings giving the general contour of the body, and more especially the bones. When these were

[1] *Edinburgh Obstetrical Trans.*, 1898.

super-imposed it was evident that the set of the pelvis in the body varied greatly. The amount of this variation I described

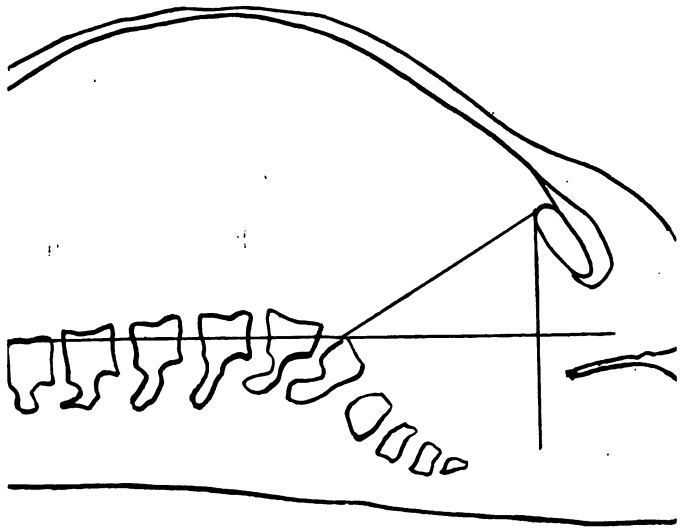


FIG. 6.—Frozen section with unusually high inclination of the brim.

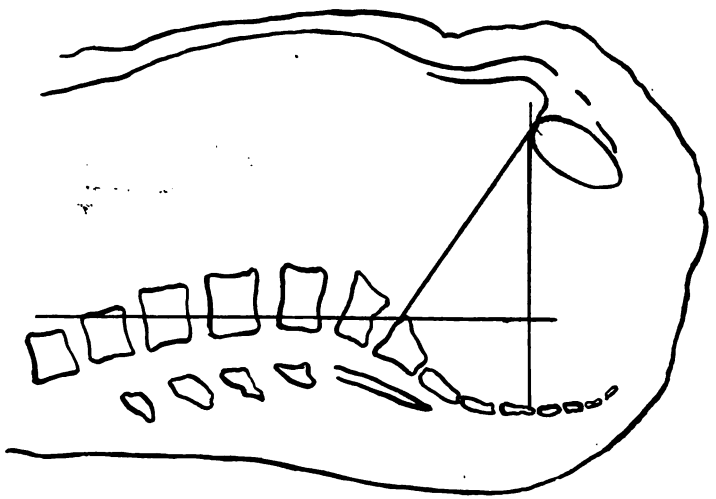


FIG. 7.—Frozen section with unusually low inclination of the brim.

in my former paper. Figs. 5, 6, and 7, taken from this paper,

show three types; Fig. 5 is the mean, or that most frequently occurring, whilst 6 and 7 show an extremely high and an extremely low set of the promontory.

The first point I wish to consider in this paper is the best method of describing the position of the promontory. We can adopt two methods. By taking the distance that it stands back from the upper margin of the symphysis, and the distance that it stands above it, we can thus localise it. If we know the length *C B* and *B A*, we can fix *A*. Or, given the length of *C A*, and the size of the angle *A C B*, we can also determine the position of *A*. In my former paper I adopted the first method, because it is simpler and expresses the following two interesting facts. If you tell the student that the promontory of the sacrum stands 3·8 ins. above the symphysis, and 2·8 ins. back from it, he at once understands it, and the figures suggest these two important considerations, that on abdominal palpation there are 3·8 ins. of pelvic contents lying under the fingers when they are palpating the lower region of the abdomen. Further, when you come to consider the expulsion of the uterine contents, supposing these to be entirely abdominal in position as they are in a multipara, with the head above the brim, there are only 2·8 ins. of pelvic cavity lying in direct line with that of the abdomen.

The other way of stating the result in terms of the length of the line *A C*, and the size of the angle *B C A* has, however, these advantages. It emphasises the length of the conjugate as one factor, thus dealing with a figure already familiar, and the question might be stated thus: Given a conjugate of 4·5 ins., where is the promontory? This depends on the size of the angle *B C A*, the mean size of which for the pelves described in my paper was 55°. While four of the fourteen actually showed this angle, there were four with lower, and six with higher angles. Putting aside the two extremes, we may say that there is a range of variability of from 40° to 60°. Further, the size of this angle has a direct obstetrical bearing. If we draw a line *p A* (in Fig. 8) at right angles to *C A*, it represents the direction of the axis of the inlet. The line *B A* prolonged to *a* gives the direction of the axis of the abdomen. *p A* is the pelvic axis, *a A* is the abdominal axis, and *p A a* is the divergence of these from one another. But it is evident that the angle *p A a* is the

same as the angle *A C B*. In other words the angle *A C B* represents also the relation of the abdominal to the pelvic axis. This will be made clear by the following illustration. If you

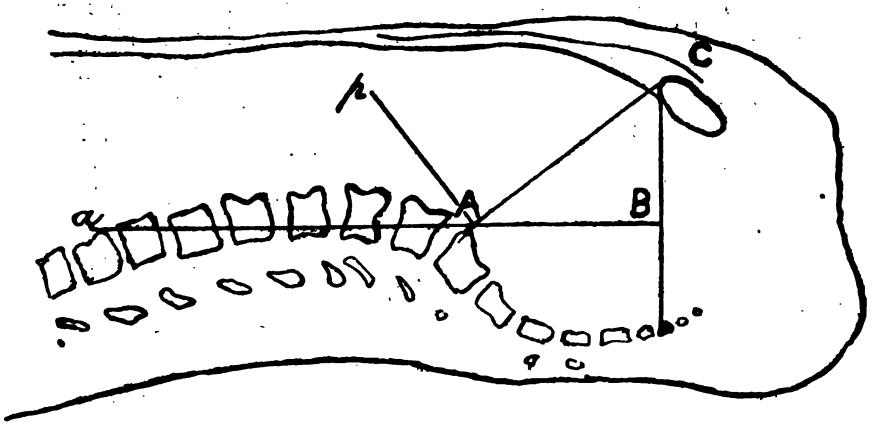


FIG. 8.—For description, see text.

raise the end of a book from the table so that it lies obliquely on it, then the angle of divergence of the book from the table will always correspond to the angle of divergence of a perpendicular on the book to another on the table. When the book is flat on the table the perpendiculars coincide, but diverge in proportion as the end of the book is raised. In this illustration the book is the brim, and the perpendiculars on it and the table are the axes of the pelvis inlet and of the abdomen respectively.

The advantage to the student of this way of describing the set of the brim is that it draws his attention to the obstetrical significance of its variability. Its significance lies in the influence that it exerts on the engagement of the head and on the driving power of the uterus. In primiparæ, where the head is already in the pelvis, the influence of the relation of the brim may not be of such importance, but in multiparæ, where the head is above that level, there must be a certain effect on labour. The importance of the relation of the abdominal axis to the pelvic axis has not been appreciated, because our ideas of labour have been based on the study of the pelvis taken out of the body. The value of this mode of

describing the pelvis is that you start from the long axis of the abdomen, and describe the pelvis in relation to it, instead of in relation to a horizontal plane which has no significance for labour, as the patient in the second stage is usually on her back and not erect. If you tell the student that the size of the angle *B C A* expresses the divergence of the uterine axis from the pelvic axis, and expresses the effort which the uterus must put forth to throw itself into line with the pelvis if its contents are to be expressed with a minimum loss of force, he at once sees the obstetrical significance of a dry anatomical fact.

The conclusions on this point might be thus summarised:—

(1) The inclination of the brim, instead of being described in reference to the horizontal plane, may be described in relation to a perpendicular let fall from the upper margin of the symphysis on a line passing through the promontory in the direction of the long axis of the abdomen. The advantage of this method is, that instead of taking a plane outside the body, which has no obstetrical significance, and to which the relation of the pelvis changes with every posture, a fixed line within the body is taken.

(2) The angle of divergence of the plane of the brim (*i.e.*, the plane passing through the conjugate of the brim) from this perpendicular, is necessarily the same as the angle of divergence of the axis of the brim, from the long axis of the abdomen. The smaller this angle, *i.e.*, the more nearly the plane of the brim approaches in direction this line, the more does the pelvic inlet come into line with the long axis of the abdomen.

(3) The range of divergence in pelves obstetrically normal is considerable, varying from 40° to 60°. While a mean may be taken of 55°, the variability of pelves from this, within certain limits, is a more important fact than the constancy of this angle, which the mention of a figure is apt to convey.

(4) Though we are not in a position to gather up from clinical observation the results of this anatomical fact, owing to the difficulties of determining the size of this angle in the living subject, it is evident that its variability must exert a

distinct influence on the engagement of the head and the driving power of the uterus in multiparæ.

This method of regarding the inclination of the brim implies a different mode of describing it, which might with advantage find its way into our text-books. Instead of a diagram (Fig. 9) showing the pelvis only, and in the upright position, and referring its inclination to the horizontal plane outside the body, we should have a diagram (Fig. 10) including the lumbar portion of the spine, representing it in the dorsal posture, and referring the inclination of the brim to a perpendicular let fall on the long axis of the abdomen, which is practically a horizontal plane *passing through the pelvis.*

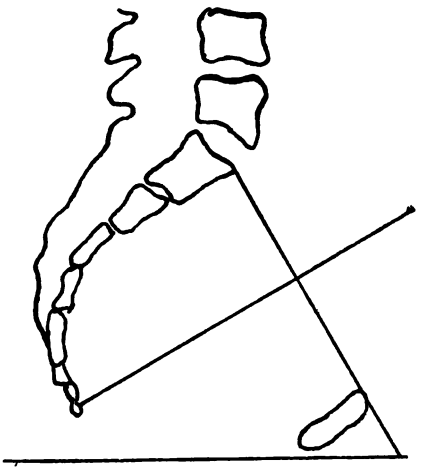


FIG. 9.—Diagram showing inclination of the brim to the horizontal plane, as usually given in text-books.

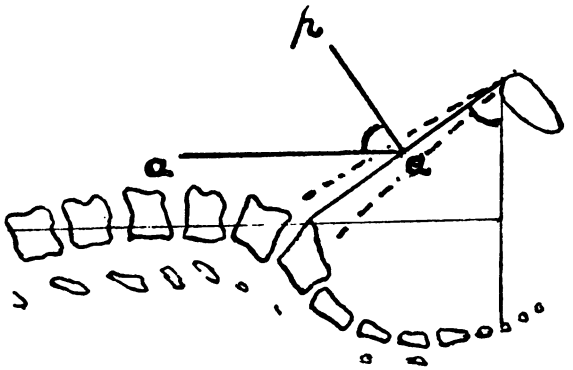


FIG. 10.—*p a*, pelvic axis; *a a*, abdominal axis, or axis of uterus as it lies in abdomen. The dotted lines represent the range of inclination of the brim.

Further, the inclination of the brim should be marked, not only by a line representing the mean, but also by a maximum and minimum inclination for pelves obstetrically normal. This

would bring home to the student that the normal is not one definite angle but a range of variation. To this diagram the uterine axis, and that of the pelvis inlet may be added, so as to bring out the fact that the angle of their divergence is the same as the angle of divergence of the plane of the brim from the perpendicular. By starting with such a representation of the pelvis instead of the one at present used in our books, the student will, from the beginning, study its form in relation to the physics of labour.

Since studying this subject of the inclination of the brim in the light of frozen sections, a study which has only been made possible during recent years by the publication of a sufficient number of these, taken from pregnancy and labour, I have gone into the literature of this subject as investigated clinically. It is very extensive, because we cannot separate the question of the position of the pelvis in the body from that of the direction of its axis. The discussion of the one involves the other, the main interest to the obstetrician of the position of the pelvis in the body being the direction of the canal, and its effect on labour.

A survey of the literature[1] suggests its grouping into two periods, which might be thus characterised: first, the statement of the problem, and second, the various methods of solving it. In the first period I would include all the work done up to Naegele, in the second all that has been done since. As we shall see, up to his time little more was achieved than to ascertain what the question at issue was, and any attempt at its solution was little more than a happy guess. For it is one thing to say that the brim of the pelvis is inclined at 55° to the horizontal plane, and quite another to prove it, for proof means an induction from a sufficient number of valid observations.

The names belonging to these two periods might be thus grouped:—

[1] I have not included in this the literature of Frozen Sections, which belongs to what might be described as a third period, at the beginning of which I should place Fürst's valuable monographite.

First period: Statement of the problem.

1701 Deventer	1754 Levret
1745 Müller	1759 Camper
1751 Smellie	1774 Bang
1751 Röderer	

Second period: Methods of solution.

1. By estimating inclination of outlet—*Naegele.*
2. Same *plus* observations on cadaver—*W. and E. Weber.*
3. Studying effect of posture—*Meyer.*
4. Estimating inclination of External Conjugate—*Prochownik.*

The first reference to the inclination of the pelvis is found in the writings of Heinrich van Deventer, the eminent Dutch obstetrician, whose text-book on Midwifery, published in 1701, was soon translated into German and English.[1]

Regarding Deventer and his book, Naegele says, "He was a man of excellent parts, thoroughly earnest in his scientific aspirations, and filled not less with zeal for his profession than with enthusiasm for his opinions. He possessed great talent for mechanics, and great dexterity therein. His work shows deep reflection and great experience. His was the first thoroughly scientific book on obstetrics, and even in our time it might serve as a pattern for those books which in their formal setting-forth of the bad conventions of midwifery almost resemble the vade-mecums of the veterinary surgeons; or as a compendium of a branch of therapeutics, which by its nature lends itself to a systematic representation as well, if not better, than any other branch of medicine."[2]

Our College of Physicians' Library has only the English translation of the fourth edition of the *Midwifery.* The plates show the pelvis seen from the front, and also from the side; in

[1] Heinrich van Deventer — *The Art of Midwifery* (translation). London, 1746.

[2] F. C. Naegele—*Das Weibliche Becken.* Carlsruhe, 1825.

the latter (Fig. 11), the left innominate bone is removed so as to show the pelvic cavity. In the descriptive text he says, "For a two-fold reason, we thought fit to represent these bones sideways. First, that by this means the bending of the os sacrum might be exactly shown; for it was impossible to show that bending in the first figure, in which the cavity of the pelvis and its outward parts are plainly seen, so in this, the inward parts, and chiefly the bending of the os sacrum, are more conveniently represented. . . . Another reason for proposing this figure was, that in the beginning I might free midwives from an erroneous opinion which they are commonly led into, because they do not accurately understand the situation of these bones; for they commonly persuade themselves that the womb and its neck are seated according to the length of the body, and therefore when they handle a woman, they pass their fingers straight according to the length of a woman. . . . The cavity of the pelvis does not tend in its length according to the length of the back-bone, but rising from the bottom obliquely, it ascends forwards, and so proceeds, as if through it you would touch the navel; wherefore those that seek the mouth of the womb must not thrust their fingers straight towards the bending of the os sacrum, but moving them upwards from the bottom, as if through the private parts they would touch the navel with their hands."

FIG. 11.—Deventer's plate showing the pelvis, as seen from the side.

From these quotations it will be evident that Deventer fully appreciated the value for clinical work of representing the pelvis in section, and though he does not mention the axis of the pelvis, the change in direction of brim and outlet are sufficiently well indicated for practical purposes.

Forty-four years after the first issue of Deventer's *Midwifery*, J. J. Müller,[1] a Swiss graduate, in an inaugural dissertation on "Rupture of the Uterus," first mentions the pelvic axis, which he describes as a line passing from the umbilicus through the middle of the pelvic cavity to the coccyx. In this we have nothing more than Deventer's description, only the name "pelvic axis" appears now for the first time. To Müller, however, belongs the credit of first drawing attention to the inclination of the brim. He says that if you place a block of wood twenty lines high under the end of the sacrum you give the brim the inclination of 45°, which it has in the living subject. This is the inclination for the female pelvis, that of the male being inclined at 25°, the difference being due to the greater length of the sacrum in the female. Curiously enough, he says in another place that the axis of the pelvis, *i.e.*, the line running from the umbilicus to the coccyx, is at right angles to the horizontal plane. This is, of course, equivalent to saying that the brim is not inclined to the horizon, unless the axis of the inlet is supposed to be oblique to this plane.

Six years later (1751), Smellie published the first volume of his great work on *Midwifery*, which was followed three years later by the *Anatomical Tables*. Of the first chapter dealing with the structure and form of the pelvis, Section II. is concerned with the brim, outlet, and axis of pelvis. As to the latter, he says, "When the body of a woman is reclined backwards, or half sitting, half lying, the brim of the pelvis is horizontal, and an imaginary straight line descending from the navel would pass through the middle of the cavity; but in the last month of pregnancy, such a line must take its rise from the middle space between the navel and the scrobiculus cordis, in order to pass through the same point of the pelvis."[2]

It will be noted that Smellie makes no statement as to the position of the pelvis in the upright posture, and that his description of the axis of the inlet is similar to that given by Deventer, while he does not call it by that name, which, as we

[1] J. J. Müller—*Dis. Sist. Casum Rarissimum Uteri in Partu Rupti.* Basileæ, 1745.

[2] Wm. Smellie—*The Theory and Practice of Midwifery;* Sydenham Society's edition. London, 1876.

have seen, was introduced by Müller only a few years previously It is difficult to know exactly what he means by making this "imaginary straight line" have a different direction in the last month of pregnancy, unless he wishes to suggest that the inclination of the pelvis becomes less, and its axis therefore more vertical.

In the same year, Röderer, the celebrated German obstetrician of Gottingen, who had studied under Smellie, published his monograph on the axis of the pelvis.[1] While he says nothing regarding the inclination of the brim, he makes the outlet to be inclined to the horizon at an angle of 18°; and the axis of the pelvis is, according to Röderer, a line perpendicular to this last. That is, while Müller uses the term "axis" of the inlet only, Röderer applies it to the outlet only. He seems to have been the first to ascertain the inclination of the outlet by measurement on the living subject. The distance of the lower edge of the symphysis, and of the tip of the coccyx from the horizontal plane were measured, and the latter found to be 1½ ins. greater than the former—the person standing erect. This is a greater inclination than subsequent observations have shown to be the case, but Röderer has the credit of being the first to investigate it clinically.

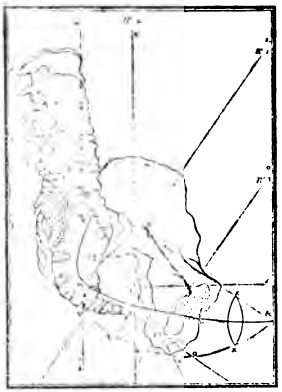


Fig. 12.—Levret's drawing of the pelvis. For description, see text.

A few years later (1754) there was published in France Levret's textbook of *Midwifery*. Our College Library has the second edition issued in 1761.[2] It contains a drawing of the pelvis (Fig. 12), which, as Naegele remarks, recalls that given by Deventer, on which it is evidently based. On it he draws three lines antero-posteriorly, one passing through the upper margin of the symphysis and the junction of the fourth and fifth sacral vertebræ, and which represents the horizontal plane when the body is erect; a second through the same part of the symphysis

[1] J. G. Röderer—*De Axi Pelv. Progr.* Göttingen, 1763.

[2] Andre Levret—*L'Art des Accouchements*, etc. Paris, 1753.

and the promontory of the sacrum, which is inclined to the former line at 35°; a third parallel to the second, but passing through the tip of the coccyx. Perpendiculars are let fall on each of these lines, which are called the three axes, and the relation of these axes to a parabolic line representing the curvature of the sacrum, is described. Levret gives no reason for his placing the pelvis with the brim inclined at 35° to the horizon, for there is no reference to measurements made on the living subject. The chief interest in his figure is the "parabolic line," which, though drawn arbitrarily, represents in its upper two-thirds the direction of the axis of the pelvis, as we now understand it.

It is interesting, at this stage in the history, to note how the different points in pelvic anatomy, which to us now are commonplaces, have emerged—each writer making his own contribution. Deventer first indicated generally that the bony canal is curved, Müller described the axis of the inlet, Röderer of the outlet, while Levret traced it through the canal. As regards the position of the pelvis in the body we have Müller's statement that this is most nearly represented by placing a block $1\frac{3}{4}$ ins. high under the end of the sacrum, and Röderer's attempt to fix the inclination of the outlet by measurements made from the horizontal plane.

The next contribution to this subject was made by Camper, in his Dutch translation of Mauriceau.[1] The English translation by Chamberlen makes no reference to the position of the pelvis in the body or its axis, but Camper has added to his translation his own description of a pelvis with three drawings. He makes the brim almost vertical, giving it an inclination of 75°. I have not been able to see Camper's profile drawing of the spinal column and pelvis, which Naegele describes as "the first satisfactory representation, which has up to now hardly been excelled."

The most complete and correct description of the pelvis, before the time of Naegele, is given by J. Bang, in a graduation thesis for the doctor's degree.[2] He describes the brim as being

[1] Peter Camper—*Tractaat van de Siektens der Swangere Vrouwen*, etc. Te Amsterdam, 1759.

[2] J. Bang—*Tentam. Med. de Mechanismo Partus Perfecti.* Havniæ, 1774.

inclined to the horizontal plane at 55° in the erect posture, and that a perpendicular let fall on its centre forms the axis. He makes the outlet run to the lower end of the sacrum (instead of the coccyx), which is 1½ ins. further removed from the horizontal plane than the lower end of the symphysis. The outlet is inclined 19° to the horizon. These figures are the same as those given by Röderer, but we must remember that the latter made his measurements from the tip of the coccyx, instead of the lower end of the sacrum. Bang, therefore, makes the inclination of the pelvis much less than Röderer; in fact, as much below what we now regard as the normal inclination as Röderer's description is above this.

There are other names which might be quoted in a survey of the literature of this first period, but they made no contribution of any importance. We would note, however, that Baudelocque, in his description of the pelvis, says that the inclination is so variable in different individuals that it is not worth attempting to define it.

This concludes the survey of the first period, from which we see that little more has been done than to state the problem, viz., what is the position of the pelvis in the body, and by what means can this be ascertained? Hints have been thrown out as to its solution, individual specimens have been placed in the position which the observer thought was the correct one, but no systematic attempt has been made to solve it.

The second period, which includes various attempts to solve the problem of pelvic inclination by extensive and exact observation on the living subject, dates from Naegele, whose monograph on the female pelvis is the first classic on this subject. It contains the results of his own observations, and a critical and exhaustive survey of the literature up to his own time. The most important contributions of this later period are those made by Naegele himself, W. and E. Weber, Meyer, and Prochownik. Each adopted a different method: and these may be thus described.

1. By measuring the height of the tip of the coccyx, and that of the lower margin of the symphysis from a horizontal plane, Naegele[1] endeavoured to determine the inclination of the

[1] F. C. Naegele—*Das Weibliche Becken*, etc. Carlsruhe, 1825.

outlet. In his first paper, published in 1810, based on a limited number of observations, he made the inclination of the brim to the horizon to be 55°, but a more extended series extending over six years, and published in 1817-18, led him to place the inclination of the brim at 60°. The measurement was made by means of a fine linen tape with a weight at the lower end to keep it vertical. The upper end was pressed with the finger nail against the pubis, and the distance from the horizontal plane measured. A similar measurement was made to the tip of the coccyx. He speaks of having measured 800 subjects, but his conclusions are based on "500 well-developed persons, of whom 149 were of large, 57 of small, and the rest of middle height, and who had all borne children without any special difficulty." Of these 500, the coccyx was above the level of the lower edge of the symphysis in 454, on the same level in 20, and below it in 26. The range was from $1\frac{5}{6}$ ins. above to $\frac{3}{4}$ in. below, and the average was $\frac{7}{12}$ in. above. This gives an angle for the inclination of the outlet of 11°. To determine from this the inclination of the brim he took a pelvis (Fig. 13) which he considered normal, and of which a drawing is given in his monograph. It is the average of eleven drawings of normal pelves. When this pelvis is placed with its outlet (*A P*) inclined at 11° the brim (*C B*) is found to be inclined at 60°. So much for Naegele's observations and the conclusions based on them. In judging of the value of the results obtained three remarks might be made by way of criticism.

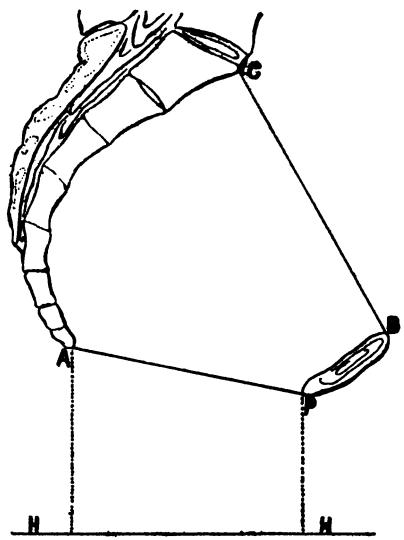


FIG. 13.—Naegele's drawing of the pelvis. The horizontal plane *H H* is also given to show Naegele's method of measuring the inclination of the outlet to it, by estimating the difference in length of the perpendiculars, *A H*, *P H*.

First, there is the initial difficulty of making measurements

on the living subject accurate to a line. When it comes to measuring the twelfth of an inch with a stretched tape it is difficult to be sure of accuracy. Naegele himself remarks on the different results obtained by different observers, and on the same person at different times.

Second, while the conclusions as regards the outlet are based on 500 cases, those on the brim are based on only 11. This is too small a number to draw a positive conclusion from.

Third, we must accept with caution results obtained in this way, because the average of a whole angle is not necessarily equal to the sum of the averages of two parts of it. Naegele's average inclination of the brim at an angle of 60° is obtained by adding an average of 11° to an average of 49°. Now, unless we assume that with an increase in the smaller component angle there is always a diminution in the larger, and *vice versâ*, we shall find that the sum of the components will not represent the whole angle.

2. By letting fall perpendiculars simultaneously from the symphysis and coccyx, and also recording the distance between them, *i.e.*, the length of the conjugate, W. and E. Weber[1] improved upon Naegele's method. Naegele does not seem to have measured the length of the conjugate of the outlet, and it is evident that this must be known before we can estimate its inclination to the horizontal plane. We must know the length of a line as well as the distance of its ends from a plane, before we can determine its inclination to that plane. It is curious that Naegele seems to have overlooked this fact entirely. Their measurements were made in 15 cases, for which the average inclination of the outlet was found to be 16·5°. The special value of the Weber's work, however, the original part in it which justifies our speaking of it as a new method, *was the use that they made of the fresh cadaver to study the inclination of the brim.* Naegele simply used a dried bony pelvis, and placed it in the position which he found the outlet to occupy in the living subject. The brothers Weber took the whole body and endeavoured to ascertain how the trunk was balanced on the lower limbs. They concluded that the angle which the pelvis

[1] W. and E. Weber—*Mechanik der Menschlich, Gewerkzeuge.* Göttingen, 1836.

makes with the spinal column is unchangeable on account of the firmness of the attachment of these parts to each other; that when the limbs are fixed in the erect posture the pelvis rotates round an axis passing through the heads of the femora; and that a line passing through the articulations of the head and neck and the end of the coccyx (*i.e.*, a line passing through both ends of the spinal column) represents the vertical for the erect posture. They found the difference between brim and outlet to be in one cadaver 55°, in another 43°. The average of these two, *i.e.*, 49°, added to the inclination of the outlet, say 16°, gives an inclination of the brim for the male of 65°. Their results differ from those of Naegele as regards the inclination of the outlet, and though, curiously, the angle of difference between brim and outlet is the same as that found in Naegele's normal pelvis, viz., 49°, it is questionable whether an induction based on two observations only, and these of such extremes as 55° and 43°, is valid. The great value of their work is the new standpoint—studying the inclination of the brim, not from the dried pelvis removed from the body, but in relation to the spinal column and the lower limbs; and though even here their conclusions were wrong, as shown by the work of Meyer who followed them, yet the credit of introducing the method belongs to them.

3. I pass over the work of Litzmann, who made no special contribution to the work now before us, to that of Meyer,[1] who demonstrated that a fixed inclination for the individual does not exist, but that *the inclination of the brim varies with posture.* He pointed out the mistake of Weber in maintaining that the trunk rotated round an axis passing through the acetabula, by showing that the centre of gravity lies behind the axis of the joint, equilibrium being maintained by the stretching of the ligaments, especially the ilio-femoral. The position of the pelvis being thus determined by the stretching of the capsular ligaments of the hip-joint, he proceeded to determine the inclination of the pelvis to the femur, and of the femur to the horizontal plane. His method was the following. The

[1] H. Meyer—"Die Beckenneigung," *Reichert's und du Bois-Reymond's Archiv*, 1861. *Statik und Mechanik des Mensch. Knochengerustes.* Leipzig, 1873.

femora were removed from the pelvis, the capsular ligament being preserved, and fixed in an apparatus, allowing rotation, abduction, and various combined movements. Three positions were taken as well defined: the upright posture, with the femora inclined at 83° to the horizon, and rotated inwards 5° (the zero of rotation being when the most prominent posterior part of the four condyles are in one plane); the same with the knees touching; the military position, with the knees touching and the toes turned out, the feet forming a right angle. The angle of inclination of the female pelvis, for these positions respectively, was 54·5°, 58·2°, and 62·9°. In other postures the inclination was much greater, even 90° or 100°. The significance of Meyer's work is evident; it obliges us to discount many of the observations made before his time, which were made without any regard to the posture of the patient while the measurement was being taken.

4. Yet another method of determining the inclination of the brim was used by Prochownik, who endeavoured to measure it directly.[1] As the internal conjugate diameter is inaccessible, he took the external conjugate. Posteriorly, he took the fifth lumbar spine, and measured the height of this point above the horizontal plane; anteriorly, the position of the upper margin of the symphysis was noted in the same way, as also the distance between these points. It is evident that the line joining these points does not represent the direction of the conjugate of the brim. The slope of the latter must again be a matter of inference deduced from the study of dried preparations or frozen sections. Even this method, therefore, cannot be called a direct one, although there is not so much room for error in estimating the relation of the inclination of the brim to that of the external conjugate, as its relation to the direction of the femora, or to the conjugate of the outlet.

Of his conclusions, based upon more than 100 observations, of which a good many are from cases of pregnancy, the following one is the most significant for the question before us. "The greater number of pelves have an inclination of from 50° to 60°, but there are so many between 45° and 50°, as also between

[1] L. Prochownik—"Ueber Beckenneigung," *Archiv f. Gyn.*, Band XIX. S. 1.

60° and 65°, that we must either consider the normal range for our people to be one of 20° (45°, 65°); or assume a normal range of from 50° to 60°, with sub-normal zone of from 45° to 50°, and a supra-normal of from 60° to 65°; only when the inclination is between 45° or above 65°, can we consider it pathological." Prochownik, therefore, approaching the subject from the clinical standpoint, came to the same result as we have done from the study of frozen sections.

So much for the various methods which have been employed to ascertain the inclination of the pelvis in the living subject. We see how the scope of the inquiry has extended from the placing of a dried pelvis at a certain angle to a study of its position in the body, and that the question of the inclination of the brim has been found to be the more complex the more carefully it has been investigated.

Since writing the foregoing, another important series of observations made by my assistant, Dr Sandstein, has come under my notice. These were made as a preliminary to an investigation into the results of symphysiotomy, which he has embodied in a thesis. He has kindly allowed me to use the measurements to elucidate the question before us now. In the course of his observations he was led to measure the height of the promontory above the sacrum in 28 cadavera, noting also the length of the conjugate. The bodies were all examined under the same conditions, and with the least disturbance of parts compatible with exact measurement. His observations cover twice as many cases as I could collect from the more limited material of frozen sections, and form, so far as I know, the most extensive series of measurements of this nature made on the fresh cadaver. I need not point out how much more valuable observations made on the cadaver, with the cartilage and ligaments fresh, and the bones *in situ*, are than those made on dried pelves. In fact, no measurement made on dried pelves can exactly correspond to the living subject, on account of the alteration in the cartilage and ligaments in the process of drying.

Putting on one side two pelves with a conjugate below 4 ins., I have tabulated his figures as follows:—

Measurements made on the Fresh Cadaver.

	Grouped according to Length of C.V.	Height of Promontory.	Position in Series arranged according to Height of Promontory.	Angle *A C B.*
1	5·80	5·40	1	69°
2	5·56	4·8	3	60°
3	5·16	4·84	2	68·5°
4	(2) 5	4·8 4·48	3 5	76° 65°
5	4·96	4·60	4	68°
6	4·92	4·4	6	64°
7	(2) 4·8	4·4 4·28	6 7	70° 65°
8	(2) 4·60	4·16 3·92	9 12	65° 59°
9	4·52	4·20	8	70·5°
10	(2) 4·50	4·16 4	9 11	68° 63°
11	(2) 4·44	4·08 4	10 11	65° 63·5°
12	4·32	4·20	8	77°
13	4·28	3·72	16	61°
14	(3) 4·20	3·80 3·68 3·6	14 17 18	64·5° 61·5° 60°
15	4·16	3·68	17	61°
16	(3) 4·12	43·88 3·80	11 13 14	75° 70° 68°
17	4	3·76	15	69°

These 26 pelves, arranged according to the length of the conjugata vera, fall into 17 groups, as the first two columns show. The figure in brackets is the number of pelves in each group. In these 26 cases, taken at random, the true conjugate ranges from 4 ins. to 5·8 ins.

The third column gives the height of the promontory, which is found to range from 3·7 ins. to 5·4 ins. On running our eyes down this column, we note that while there is a general diminution as we pass downwards, the figures are not in series. To bring this out I have placed, in the fourth column, figures representing the position of these pelves in a series ranged according to the height of the promontory. The repetition of the same figure means that two or more pelves occupied the same position in the series. Thus "3" and "3" have the same height of promontory—viz., 4·8 ins.

The reason for the figures being out of order in this series will be found in the fifth column, which gives the variation in the angle *A C B*. The range of angle for these 26 cases is from 59° to 77°, one of 18°. The mean is 65°.

It will be noted that the maximum and minimum are both

much higher than the results obtained by myself from frozen sections, and by Prochownik from the living subject. This I attribute to the fact that the muscles were severed from the pelvis anteriorly, so as to make it accessible for examination. The effect of this is to allow the symphysis to descend, and to make the brim more vertical. That this is the disturbing factor is evident, I think, from the fact that both the maximum and minimum are raised in proportion. This, however, does not affect the value of the conclusion that we have here again a range of nearly 20° in the set of the brim.

The conclusions from a study of this Table are as follows:—

1st. In this series of pelves taken at random, we have, instead of a constant conjugate of 4 ins., a range of from 4 to 5·8 ins.

2nd. An increase in the length of the conjugate does not imply a proportionate rise in the level of the promontory: on the contrary, the position of the latter, while sometimes the same, is sometimes above, sometimes below, what we should expect were the pelves constructed on a fixed type as regards the set of the brim.

3rd. The cause of this variation in its level is the variability in what I have called the set of the brim, which is a range of nearly 20°.

So much for conclusions bearing on the results obtained from frozen sections. A fourth deduction from this series is, that while the measurements made on the cadaver are of greater value than those made on the dried pelvis or skeleton, the effect of opening the abdomen and detaching the muscles is to increase the angle of the set of the pelvis.

One word to justify the introduction of the new term. The word inclination suggests a relation to the horizontal plane; what is wanted is a phrase to suggest relation *to the axis of the body*. The term "set of the pelvis" in the body expresses this idea. It might be said, why not describe the set of the brim in terms of the angle which the brim makes with the long axis of the body instead of in terms of the angle which it makes with a perpendicular to the latter. Instead of the angle 55°, we should then have an angle of 35°. This figure

however, suggests another, while the other—viz., 55°, gives the degree of divergence of the abdominal and pelvic axis.

If I were to put in one sentence the significance of these new observations and my object in bringing them forward, it is this: That the work of Meyer, by drawing attention to the variations in inclination due to posture, diverted attention from those due to the set of the pelvis in the body, which a study of frozen sections has brought into prominence.

Professor Simpson had listened with lively interest to Dr Barbour's paper. It formed a quite distinct advance in our apprehension of the typical construction of the pelvis, and was a worthy continuation of the great work that had been done by Deventer and the other authorities who had studied this so important subject. It was to the credit of the Society that a communication of such literary and scientific value should appear in its Transactions.

The President also made remarks.

Dr Barbour replied.

MEETING VIII.—(Additional) JUNE 27, 1900.

Dr R. MILNE MURRAY, *President, in the Chair.*

I. *Professor Simpson* showed—

(*a*) DERMOID CYST. Mrs B., æt. 25, i.-para, in September 1898 was confined; labour difficult and instrumental. A week after, pain developed in the lower part of the abdomen, and Dr Fordyce, who was sent for to see the patient, found her exceedingly ill—abdomen markedly swollen, and there was a large trocar through the abdominal wall, through which pus and fæces were exuding. Tapping had been done for a supposed suppurating ovarian tumour. Diagnosis of suppurative peritonitis was made and the abdomen opened and washed out as far as allowed by the extensive matting of the intestines; a drainage tube was left in. In spite of her serious condition (pulse 140, temp. 105°) patient recovered, but with a fæcal fistula. *State on admission*, May 7, 1900.—Patient thin, and suffering from a

rash on the hands and feet. Diagnosed by Dr Allan Jamieson as erythema papulatum. On the surface of the abdomen is scar of former incision, well healed at lower end, but at upper end the skin is red and unhealthy, and there is a depression about 2 ins. below and to the left of umbilicus—from this a little fluid with a fæcal odour exudes. Fluid can be injected through this opening and escapes into the bowel. And a pair of suius forceps thrust into the opening brought up a tuft of brown hair (Mr Cathcart). *Operation.*—On May 19, abdomen opened by an incision to right of the old cicatrix. Very numerous and firm adhesions. A tumour, size of an orange, found adherent to bowel and to abdominal wall beneath fistulous opening. This tumour found to be in the left ovary, the broad ligament being drawn up. The pedicle of the tumour was ligatured and cut, and the tumour itself, after great difficulty, freed from the bowel. In one place the gut wall was torn through, this opening being at once closed by a double layer of Lembert sutures. The skin around the fistula was then cut through, and the tumour lifted out with this unhealthy patch of skin. The abdominal wound was closed by silkworm gut sutures passing through the whole thickness of the wall. Incision was Y-shaped. *Progress.*—On May 23, foul discharge issued from abdominal wound, seemed at first to have fæcal smell, but ultimately was like ordinary pus. Bowels were moved on May 25. Patient since has made very good recovery. Abdominal wound completely healed, has been up three or four days, wearing an abdominal belt.

(*b*) TWO FIBROID UTERI REMOVED BY PAN-HYSTERECTOMY. Barbara E., single, æt. 46, o.-para. For at least eight years past she has had a swelling in the abdomen. This, from its weight and dragging, has practically rendered her unfit for work. There seems to have been a moderate degree of menorrhagia for years past, but this has been less for the past twelve months. The tumour has not altered much in size during the last year. *On admission*, May 23, 1900, large tumour of irregular nodulated outline fills abdomen from pubes to a hand's-breadth above umbilicus. Some of the nodules are hard, others are distinctly softer. No striæ and no enlarged veins in the abdominal wall. A small umbilical hernia. A bruit heard

over the lower part of the tumour. This tumour found to be continuous with cervix, on vaginal examination. *Operation* on June 16, abdominal, pan-hysterectomy. Long median incision from pubes to 1 in. above the umbilicus; 5 or 6 ʒ of yellow fluid found lying free in the peritoneal cavity. A large nodular fibroid tumour was found, and delivered through the abominal incision. Pan-hysterectomy then performed. Tumour weighed 16½ lbs. *Progress.*—Very good, pulse never over 85 since operation.

Mrs C., æt. 34, iii.-para. Three years ago, after birth of her second child, her doctor told her there was a tumour in the left lower part of the abdomen, and she could then feel it herself. Her periods became excessive, and she grew weak, but became pregnant again, and in October 1898 was delivered of a seven months' child. Labour easy, no excess of bleeding. Since then the menorrhagia has been more marked, till for the last six months she has been bleeding for five or six days every fortnight, with a brown inter-menstrual discharge. She has grown weak and pale from the constant loss of blood. *On admission*, May 12, 1900.—A rounded tumour rising from in pelvis to level of umbilicus. Elastic in consistency but not fluctuating, and with a well-marked bruit over it. On pelvic examination this tumour found to be uterine, and chiefly in the anterior wall of the uterus, the os being patulous enough to admit a finger for two inches. *Operation* on May 30, pan-hysterectomy. *Progress.*—Patient made an uninterrupted recovery, and is now able to be wheeled about in a chair. Has gained in strength and colour since the operation.

II. *Dr Lamond Lackie* showed an EARLY EXTRA-UTERINE GESTATION. He said it was really a tubal mole, the result of early rupture of a tubal pregnancy. The patient from whom it was removed had one child five years ago. Since then she had been quite regular till the beginning of March of this year, when she menstruated normally. In the beginning of April she missed a period, but towards the end of the month she had an attack of pain in the left side and this was accompanied by a slight hæmorrhagic discharge. During May and up till the 10th of June she had frequent attacks of pain so severe that once or twice she

fainted, and these attacks were generally, though not always, accompanied by a slight hæmorrhage. About the middle of May she passed what she described as a piece of "red skin." Dr Lackie saw her on June 11. On examination he found milk in the breasts, the lower part of the abdomen was somewhat tender, and on vaginal examination the uterus was felt lying forward and not much enlarged, while behind and to the left side was a cystic-like mass somewhat fixed. A diagnosis of an extra-uterine gestation was made, and the patient was removed to a home for operation. This he did on June 18. The sac was very adherent to the pouch of Douglas, but it was brought up entire until just as it was being brought through the abdominal incision, when it burst and some blood clot escaped. The left ovary was removed along with the distended tube. The patient is making an excellent recovery. Dr Gulland examined the specimen and reported that the naked eye appearances suggested an extra-uterine pregnancy. The part of the clot examined under the microscope contained a shred of what looked very like the chorion and amnion, but no villi were discovered. The wall of the structure was certainly the Fallopian tube.

III. *Dr Haig Ferguson* showed a UTERUS he had removed by vaginal hysterectomy for cervical cancer, from a patient aged 67. The patient has had nine living children, and six miscarriages. Her last child was born twenty-eight years ago, and her last miscarriage was two years later. Her menstruation was of the twenth-eighth day type, and scanty; it stopped gradually twenty years ago, and there was no flooding at the menopause. She began to menstruate at 15 years of age. The patient is a healthy vigorous-looking woman, who has suffered no ill-health since her last miscarriage twenty-six years ago, and till the present illness, has *had absolutely no vaginal discharge of any kind* since her menopause. She is well nourished, but has become a little thinner lately. About two or three months ago some leucorrhœal discharge commenced, which became brownish in colour and had a bad smell. She has had no pain. A few days before admission the discharge became red. On examination the uterus was

felt slightly enlarged, retroverted, and with practically complete atrophy of the vaginal portion of the cervix. The os was slightly patulous, and with ragged edges, the cervical canal was excavated by a cancerous ulceration which was characteristically friable and bled freely on scraping with the finger-nail or curette. The discharge was intensely fœtid. The uterus felt fairly free and mobile, but could not be pulled down quite to the vulvar orifice. Two days after admission to hospital, the diseased cervix was well scraped and phenolized. Three days later (16th June 1900), Dr Ferguson performed vaginal hysterectomy. The only difficulty in the operation was in starting the separation of the bladder from the cervix, as the bladder was attached quite down to the level of the external os and there was very little cervix free from bladder to hold on by. After this primary difficulty was overcome, however, separation was easily effected. The patient made an excellent recovery, with a rapid convalesence. The specimen shows the uterus, which was cut open after removal, and attached close to the fundus is a submucous fibroid about the size of a large bean. The Report from the Royal College of Physicians Laboratory (by Dr Lovell Gulland), is that it is a degenerated submucous fibroid, and that the uterine wall and covering of the fibroid show atrophied mucosa, with numerous small cysts lined with flattened uterine epithelium. This, of course, is the usual senile degeneration. The instructive point is that a submucous fibroid should be present in this uterus, since, no doubt, before the menopause; that it produced absolutely no symptoms of any kind, and that it was only discovered accidentally after the uterus had been removed for a cancerous cervix, twenty years after the menopause.

IV. *Dr Stuart Nairne* showed a UTERUS WITH PLACENTA *in situ*, removed from a dwarf at full term by Cæsarean section.

V. *Dr Brewis* showed (*a*) a FIBROID TUMOUR OF THE UTERUS removed by sub-peritoneal hysterectomy. (*b*) An ENLARGED VERMIFORM APPENDIX removed during the quiescent stage, after repeated acute attacks. The appendix at the time of removal was on the point of rupturing.

VI. *Dr Foulis* showed a series of PHOTOGRAPHS, illustrating the development of the amnion and umbilical cord.

VII. SUPPRESSION OF URINE FOLLOWING CYSTITIS.

By J. LAMOND LACKIE, M.D., F.R.C.P.Ed., Gynæcological Tutor, Royal Infirmary, Edinburgh.

CHRONIC cystitus, so difficult to cure, may continue for many years without endangering the patient's life, and when it is the primary cause of a fatal issue, it is very rare that the bladder is found to be the only part of the genito-urinary apparatus affected at the time of death. Patients have been known to die from sheer exhaustion produced by the well-known symptoms of cystitis, but in the great majority of cases serious pathological changes have occurred in adjacent or distant structures, and these have been the immediate cause of death. No doubt, in fatal cases, the commonest secondary lesion is septic pyelonephritis, and this is so even when the primary disease in the bladder is tubercular in nature, but, on the other hand, secondary acute general tuberculosis or tubercle of the lungs or kidneys, may lead to a fatal termination. In a few cases, whether the cystitis be simple or tubercular, the formation of abscesses round the bladder and the continuous discharge from fistulæ have led to the exhaustion of the patient. In a case which I recently had under observation, the fatal issue was due to a double infection of the kidneys, and the reason I have for recording it is the remarkable absence of symptoms pointing to any renal affection, till just a short time before death, when complete suppression of urine occurred, and even then the patient did not feel especially ill, until complete anuria had existed for ten days.

Mrs S., æt. 43, enjoyed perfect health, till shortly before her marriage nine years ago. She then noticed that she had some slight pain on passing water, and not infrequently at the end of the act of micturition she observed that a few drops of blood had passed. On 20th December 1892, she was admitted to Ward 28 complaining of these symptoms, which by that time had become greatly aggravated. She had had no

children and no abortions, and menstruation was regular and normal. Micturition was distressingly frequent and painful, and examination of the urine proved the presence of pus, blood, mucus, and phosphates, but no renal casts were ever found. Occasionally at the end of the act a few drops of pure blood were passed which led one to fear that the condition was tubercular. The bladder was explored by means of the sound, and the walls were found to be excessively tender, very rough, and irregular. No calculus was discovered and the sound passed in 4 in.

Besides the usual general management, the patient was put upon local treatment by antiseptic irrigation twice daily, and later, once a week, instillation of a strong solution of nitrate of silver was practised. Notwithstanding these measures, after being in the ward for some weeks, the patient was in no wise better, but seemed to be getting progressively worse. It was therefore determined to explore the bladder more thoroughly with a view to determining the exact condition of the vesical wall, and with the object of draining the bladder effectually for some time. Realising the risk of dilating the urethra in tubercular subjects, the operation was undertaken with the greatest possible care, Hegar's bougies being used for the purpose. In the mucous membrane nothing beyond excessive congestion was discovered. No ulcer was found. The dilatation resulted in incontinence of urine, but complete relief of the patient's symptoms, so much so that she frequently remarked that she would much prefer the discomfort of incontinence to a return of the painful and frequent micturition. She remained in the ward for some weeks in this condition, and unfortunately there was no indication of returning control of micturition. Electricity was several times applied, but without any effect whatever. The character of the urine had very much improved, and the patient felt so well that she insisted on going home. She provided herself with a portable urinal, and when she became accustomed to this she was able to live comfortably, and perform her household duties with ease.

During this state of comparative comfort, which lasted for about eight years, she was a frequent visitor at Ward 28, and I

frequently saw her there. She had no complaint of ill-health, and though I several times strongly urged her to return for a plastic operation to relieve her incontinence, she, fearing a possibility of a return to her former state, consistently refused.

On the 14th of March of this year, I was asked by Dr Maclaren of Lauriston Place to see with him a patient suffering from suppression of urine. I at once recognised my old patient, Mrs S., whom I had not seen for about a year. The history I got was that she had been in her usual health till a fortnight before, when she began to suffer from slight nausea and vomiting, and that for nine days she had not passed a single drop of urine. Incredible as it may seem, I have every reason to believe that this was absolutely the case, as owing to her previous incontinence she could not fail to be struck by the change to complete anuria. The patient told me that she did not feel very ill, but was naturally much distressed and alarmed by such an untoward symptom. A catheter was passed but it entered only about 2 ins., and no urine was obtained. It was agreed that the best chance for the patient was her immediate removal to the Infirmary, and this was immediately carried out.

On admission she was somewhat indifferent, though quite sensible and even bright at times. The face was flushed and the mouth parched and dry, and the general appearance was one of intense discomfort. There was slight œdema round the ankles, but no marked general dropsy.

As soon as possible a hot air bath was given while hot digitalis fomentations were applied to the loins, and digitalis and diuretin were administered freely by the mouth. Very little perspiration occurred, and no urine was passed that day. On the following day the same treatment was adopted, with the result that she passed that evening two ounces of highly albuminous urine, and about five hours later the urine began to flow freely, but even though a winged catheter had been placed in the bladder it was impossible to estimate the quantity exactly, as a great deal escaped alongside the instrument. At the same time the patient's general condition improved to a remarkable extent. She was bright and cheerful and very hopeful of

recovery. The urine contained albumin, pus, and tube casts, but no blood.

Diuretic treatment was continued, and she progressed very favourably for eight days, when somewhat suddenly all her former symptoms returned. She had intense sickness and vomiting, complete suppression again supervened, and she gradually lapsed into a semi-comatose state. Treatment this time was unavailing, and she died four days later.

A post-mortem examination was made by Dr Fleming. Most of the organs were quite healthy. There was some slight œdema of the brain, but the chief pathological changes were confined to the genito-urinary system.

The right kidney was firmly adherent to the surrounding tissues, and the capsule was thickened and adherent to the cortex. On section the pelvis and calyces were dilated, and the mucosa was inflamed and covered over at parts by a purulent, almost gangrenous-looking membrane. Numerous hæmorrhages, and here and there typical necrotic ulcers of a greenish colour, were found. The surface of the kidney was granular, the cortex atrophied, and there was well-marked interstitial change. There were also purulent foci in the medulla, evidently secondary to a pyelitis, and to a recent and very acute catarrhal nephritis. The ureter was dilated, and the mucosa dotted over by necrotic ulcers and hæmorrhages especially near the kidney and near the bladder.

The left kidney showed its substance entirely replaced by caseous material, and the ureter was greatly atrophied and absolutely occluded near the bladder.

The bladder measured only 1¼ ins. The mucous membrane was markedly congested, and the wall was considerably thickened. Both ovaries were the seat of dermoid ovarian tumours, each about the size of a hen's egg.

This, then, was a case of non-obstructive suppression of urine. For a long time the left kidney being the seat of advanced tubercular disease had probably ceased to function, the ureter having also become atrophied and occluded. The right kidney was for long the subject of chronic interstitial and tubular nephritis, and then suddenly an acute septic nephritis supervened which led to suppression of urine, and the death of

the patient. The symptoms presented are interesting because they support the more modern view that the symptoms from obstructive and non-obstructive anuria may be exactly similar. Up till quite recently it was taught and believed that whereas in obstructive suppression the patient died without any marked symptom of uræmia whatever, in non-obstructive uræmic phenomena were always most pronounced and led to a fatal issue. In my case, beyond some dulness and occasional stupor, there were no uræmic attacks; she did not have even the muscular twitchings which are generally present in the obstructive variety. Indeed, the patient, as is quite commonly the case, did not seem seriously ill at all till just a day or two before she died. The duration of the suppression is not longer than has been observed in other cases. I find a reference to a case of ischuria that continued for forty-eight days, but since I have been unable to obtain the journal in which it was recorded I cannot tell whether it was complete for that length of time or only occasional. Sir James Paget recorded a case of complete anuria which went on for twenty-one days before death ensued; and there is another case on record where for twenty-five days the patient had total suppression of urine. In my case no urine was passed for ten days, then there was a continuous flow for eight days, and again for four days before death no renal secretion occurred. The diagnosis of the cause of the condition was not difficult. There was no indication of any obstruction to the flow of urine, and having known the condition of the bladder for so many years one naturally concluded that either acute septic infection of the kidneys had occurred, or that both had become functionless from tubercular degeneration. It curiously turned out that the first supposition was correct with regard to the right kidney: the second possibility had occurred to the left. There was no history of irritant poisoning, there was no shock, there was no hysteria, and no collapse from any fever to account for the state of the patient.

With regard to treatment, the specimens I have shown prove that this must have been unavailing, and it is remarkable that the hot air bath, digitalis, and diuretin should have at least seemed to effect a temporary improvement. Feeding was of course a difficulty owing to the excessive vomiting from which

from time to time the patient suffered, but this very vomiting, to a certain extent, acted as a safety valve for the ingestion of food would only have led to a further accumulation of waste products, and possibly an aggravation of the symptoms.

I have ventured to report the case, not only because suppression of urine from any cause is very rare, but because the record is the history of a cystitis unfavourable from the beginning to the end throughout a period of nine years.

Dr James Ritchie said that Dr Lackie's interesting case reminded him of one which had been, many years ago, reported to the Medico-Chirurgical Society, the case of a young lad who had complete suppression of urine for ten or twelve days without convulsions. In that patient there was recovery. These cases strongly supported the theory that for the production of convulsions more than one condition is required, one essential being a peculiar, unstable condition of nerve cells. In some persons convulsions are very readily induced, in others they do not occur.

Dr Ballantyne asked Dr Lackie if he had discovered any tubercle bacilli in the urine. He had a case under his charge which he believed to be tubercular disease of bladder, and probably also of right kidney; he had had the urine examined for tubercle bacilli, so far the results had been negative, but, of course, bacilli in the urine were seldom seen, and a large number of cover glasses might have to be examined before even one bacillus could be found.

Drs Foulis, Fordyce, and the *President* made remarks.

Dr Lackie replied.

VIII.—A CASE OF CÆSAREAN SECTION FOLLOWED BY SUB-PERITONEAL HYSTERECTOMY.

By N. T. Brewis, M.B., F.R.C.S.Ed.

Early one morning in April 1898, I was asked by Dr Inkster to assist him at the confinement of Mrs K. Before my arrival Dr Inkster had made a prolonged effort to bring the head into the pelvis with axis-traction forceps but had failed. I reapplied

the forceps and exerted as powerful traction as I thought was good for the patient, but without being able to move the head in the slightest. Being now satisfied that the child could not be born alive *per vias naturales*, we discussed whether the head should be broken up or whether we should attempt to deliver a living child by Cæsarean section. Dr Inkster and myself favoured the latter plan, but the husband could not be persuaded; so we performed basilysis, breaking up the base of the skull with Professor Simpson's original instrument, and extracting the child by means of the blunt hook. The operation, though tedious, was successfully accomplished, and the patient made an excellent recovery.

On 5th December 1899, the patient, acting on the advice of Dr Inkster, called on me to announce that she was again pregnant. Her last period commenced on the 22nd July, and lasted four days. She felt life on the 29th of November, and the expected time of her confinement was about the 2nd of May 1900. I had recommended that if ever she again became pregnant she should have an operation that would give her a living child, and she now expressed herself as willing to submit to such an operation provided measures would be taken to prevent a subsequent pregnancy.

She was now pregnant for the fifth time. Her first child was delivered still-born at the seventh month with forceps, the accoucher requiring to use great force. Two early miscarriages took place subsequently, and then followed the labour ended by basilysis which I have just described.

Pelvimetry gave the following measurements:—

Interspinous diameter . .	$8\frac{3}{4}$ inches.
Intercristal „ . .	$9\frac{3}{4}$ „
External conjugate diameter .	$6\frac{1}{4}$ „
Diagonal „ „ .	$3\text{-}3\frac{1}{4}$ „
True „ „ .	$2\frac{1}{2}\text{-}2\frac{3}{4}$ „

The question of the particular operation to be adopted in this case now presented itself for consideration. Symphysiotomy was out of the question, because I had promised to take measures to prevent a future conception. One of the following operations might be chosen:—1. Sanger Cæsarean section; 2. Porro Cæsarean section; 3. Cæsarean section followed by pan-hys-

terectomy; 4. Cæsarean section followed by sub-peritoneal hysterectomy. I had had previous personal experience of the Porro Cæsarean operation, having performed it successfully some years ago in two cases. I had also performed pan-hysterectomy four times between the fourth and sixth months of pregnancy, likewise with success. This experience had taught me that these operations were straightforward and attended with no special difficulties, and that total hysterectomy during pregnancy was quite as easily performed as the Porro operation. In the first total hysterectomy which I had performed during pregnancy—a case advanced to the fourth month but complicated by a solid fibroid tumour larger than a full-time uterus—I was struck by the satisfactory nature of the operation and its results, and at the time thought that if ever I was called on to operate at term for a case presenting absolute indications, I would select total hysterectomy, after, of course, delivering the child by Cæsarean section.

I have said that I consider the technique of one method as easy as the other, but the subsequent risks of hæmorrhage and sepsis are greater after the Porro operation. No operator nowadays would treat the uterine stump extraperitoneally after the removal of fibroids; he would either remove it or cover it over with pelvic peritoneum. The same should be done during pregnancy.

I would confine the use of the Porro Cæsarean method to cases where the patient is in an exhausted state and where the operator has not proper assistance, because it is an operation which can be done very quickly.

I have no experience of the improved Cæsarean section, but I decided against it on account of the danger of subsequent gaping of the uterine wound, hæmorrhage, and peritonitis, and also because the patient is liable to all risks associated with the puerperium.

We had yet to decide between Cæsarean section followed by pan-hysterectomy, and Cæsarean section followed by sub-peritoneal hysterectomy.

All that has already been said in favour of the former applies to the latter. The facility of operation and subsequent risks are not greater in one than in the other, while I

believe either can give the same good results. I selected the sub-peritoneal method of treating the stump simply because I have had considerable experience in this technique in removing fibroids by Kelly's side to side method, and have got to like the operation; but if I had been without this experience, I would certainly have performed panhysterectomy.

Operation.—Mrs K. came into my Home in the last week of April. On the 3rd of May we operated without waiting for the onset of labour. The following are the notes taken by Dr Bucknell, my clinical assistant. "The abdominal incision extended from a point two inches above the umbilicus down to the symphysis pubis. Through this opening the uterus was delivered. The lower pole of the uterus was now tightly grasped by Dr Macdonald, and then an incision about four inches in length was made in a vertical direction through the upper part of the anterior wall of the uterus. This incision was enlarged by tearing. A hand was now pushed through the membranes, the child seized and quickly extracted. A considerable quantity of liquor amnii followed. After the placenta had been separated and delivered the uterus contracted firmly, so that there was no further necessity for constricting the cervix with the hands. The ovarian arteries and the vessels accompanying the round ligaments were now tied, and the broad ligaments divided. A peritoneal flap from the lower part of the uterus was pushed down along with the bladder. The uterine arteries were then secured and the body of the uterus removed. There was little or no bleeding. The mucous membrane of the cervix and also part of the muscular wall was now cut away, and the surfaces brought together with catgut sutures; then when all oozing had ceased the peritoneum was brought together over the stump and carefully sutured so as to shut the stump out of the general peritoneal cavity and place it below the peritoneum. The abdominal wound was closed with catgut in layers." The patient made an excellent recovery, the child, a healthy female, is well and thriving, and I question if there exists at the present moment a better satisfied woman than Mrs K.

Dr Haultain said he heartily endorsed what Dr Brewis had said regarding the method to be adopted if removal of the uterus was to be performed, and if the surroundings were all that could be desired. The Tait Porro operation must, however, still hold the first place where Cæsarean section has to be undertaken without elaborate preparation being possible.

IX. ON CLEANSING THE PERITONEUM DURING CŒLIOTOMY.

By N. T. Brewis, M.B., F.R.C.S.Ed., Gynæcologist to the New Town Dispensary and to Leith Hospital.

When the peritoneum requires to be cleansed during operations, the contaminating discharges are best removed by irrigation. But irrigation of the peritoneal cavity, like drainage, is not so frequently resorted to as formerly, because abdominal surgeons have now more confidence in their technique and in the peritoneum itself.

The surgeon can now conduct an aseptic operation, and by the adoption of the Trendelenberg position he is able to see and securely ligature bleeding points, and cover raw surfaces over with peritoneum. He also knows that the peritoneum, when its absorptive power is unimpaired, can dispose of fluids and minute solid particles without peritonitis being produced, and further that it can even resist successfully the invasion of pyogenic bacteria. But whilst the surgeon recognises the ability of the peritoneum to rid itself of injurious material he will consider it his duty, when the cavity is contaminated, to relieve the peritoneum of this function as much as is in his power. This, as I have said, is best accomplished by irrigation.

The gynæcological surgeon will consider it necessary to irrigate the whole of the peritoneal cavity in cases of ruptured tubal pregnancy when the cavity contains blood; in cases of ovarian cysts which have ruptured with the peritoneal cavity before or during operation. Also when any of the contents of an ovarian tumour have escaped into the peritoneal cavity

during aspiration before extraction. This should be made an absolute rule whenever we may have any suspicion that the cyst may contain papillomatous or malignant elements. About fourteen years ago I opened an abdomen distended with ascitic fluid and found the whole of the interior studded over with papillomata. Some years previously a surgeon had removed an ovarian tumour from this patient, but had tapped the cyst a few days before the operation. The fluid which escaped into the peritoneal cavity at the tapping had infected it.

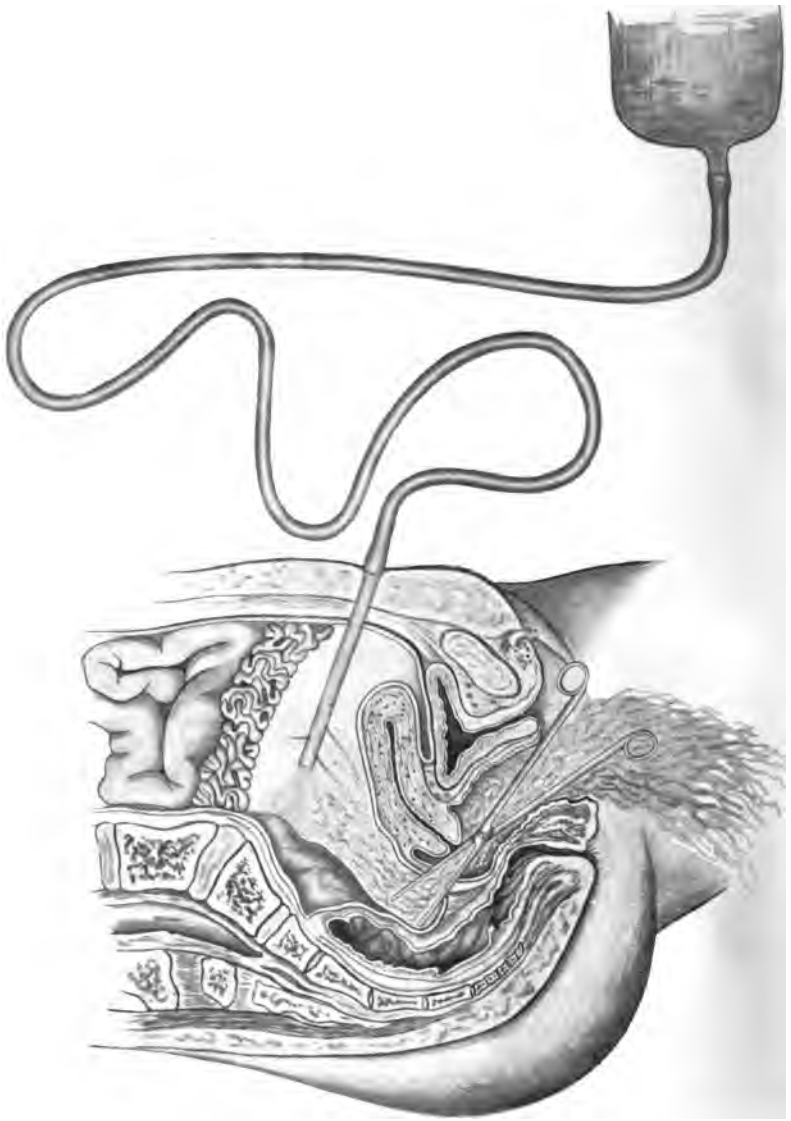
Another case which impressed me with the need for regarding with concern the escape of ovarian fluid into the peritoneal cavity occurred about ten years ago. The surgeon performed an uncomplicated ovariotomy, but during the operation some fluid from the interior of the cyst escaped into the peritoneal cavity and over the wound. A year afterwards the operator asked me to see the patient on account of malignant thickening of the cicatrix, the lower part of the abominal wall, and the pelvic peritoneum. The surgeon will also irrigate the whole abdominal cavity when a large abscess has burst and the pus is distributed among the intestines. Likewise when much hæmorrhage has attended the removal of a large ovarian or other tumour. Also when the walls of the intestines have been injured.

The foregoing remarks relate more particularly to contamination of the general peritoneal cavity, but the chief object of this communication is to draw attention to the treatment of contamination caused by pus which has escaped into the pelvic cavity during the removal of such conditions as pyosalpinx and ovarian abscess.

In removing pus sacs of the appendages the surgeon will place the patient in the Trendelenberg position. After opening the peritoneal cavity he will most likely encounter the omentum adherent to the various pelvic organs as well as perhaps to intestine and parietal peritoneum. This, along with adherent intestine, he will separate and pack off with gauze pads so that the only part of the intestinal tract left in the pelvis is the rectum. He will now enucleate the pus sacs, taking care that they are completely liberated from surrounding parts before

bringing them through the abdominal wound. This careful handling is necessary to prevent rupture, and with the same object he may before attempting withdrawal empty the sacs by aspiration. In this way he will in many cases be able to successfully remove the diseased parts without contaminating the peritoneum. But in some cases, in spite of these precautions, pus will escape from swellings where its presence was unsuspected or where the walls were thin.

When this happens what is to be done? Is he to consider the pus sterile and unlikely to cause serious results and simply trust to sponging, or is he to look upon the presence of even a small quantity of pus as dangerous and do all in his power to get completely rid of it? I think every wise surgeon will take the latter view and will ask himself what is the best plan to adopt. The guiding principle should be that the method followed must not spread the infection, and with this end in view he must not irrigate over a wider peritoneal area than is already contaminated. Care must be taken to prevent the water flowing up amongst the intestines and distributing the infection. To ensure this, the general abdominal cavity must be carefully shut off from the pelvic cavity, by packing thoroughly with gauze, and before any water is introduced the pelvis must be lowered. After these precautions have been taken the operator may hold the wound widely open and introduce a little water at a time, sponging it out and repeating the process until he thinks the pelvic cavity is clean. This method I do not consider safe, because one cannot be absolutely certain that some of the water will not find its way up among the intestines. A better plan is to use swabs soaked in water and mop out the pelvis with them. This is the plan I followed till recently. With it there is no fear of contaminating the general peritoneal cavity. Its fault is that it lacks thoroughness, and, in this respect, is inferior to the method which I will now describe, and which I recommend with confidence. Immediately the pus escapes from the ruptured sac, cover it over with a large gauze pad, and pack off the general peritoneal cavity carefully and thoroughly with gauze. Remove the diseased structures. Then introduce a long pair of forceps or blunt scissors into the



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vagina, and push its point through the posterior fornix into the pouch of Douglas and separate the handles widely to enlarge the opening. Now lower the pelvis and irrigate the cavity from above, introducing the end of the douche into the abdominal wound. The stream of water, or normal saline solution, if you use it, washes out the pelvis and escapes through the opening at the foot of Douglas' pouch into the vagina, and out at the vulva (see Plate). A speculum placed in the vagina facilitates the flow and lets a full stream through.

By this method there is no chance of the contaminating material being carried upwards into the general peritoneal cavity, and it permits of most thorough cleansing. Before adopting this plan, there was no complication during cœliotomy that I dreaded as much as the escape of pus; but now it gives me no concern, as I know how to get safely rid of it.

I have purposely avoided any reference to drainage as there is no room for the discussion of such an important subject in this brief note.

I may now narrate two illustrative cases.

Case I.

Removal of abscess of right ovary—Excision of cyst of left ovary —Fouling of peritoneum during operation; downward irrigation through the vagina—Recovery.

Mrs S., æt. 24, married 3½ years, ii.-para, youngest child 1 year old. No miscarriage.

Complaint.—Pain in the right side ever since the birth of her last child, very severe and aggravated before and during the periods.

Menstruation regular. Has had leucorrhœa since last confinement. The placenta was retained, and the patient made a slow recovery. Micturition has often been painful. Previous to marriage her general health was very good.

Physical Examination.—The uterus is displaced to the left by a firmly fixed swelling, which occupies the whole of the right half of the pelvis. The swelling is somewhat round in shape, and is of firm consistence.

Operation.—15th December 1899. Cœliotomy. Patient in Trendelenberg position. The omentum was found spread over and adherent to the sigmoid flexure, the left ovary, and the fundus uteri. The swelling on the right was encapulated and firmly incorporated to surrounding parts by strong old adhesions, and it was with the greatest difficulty that it could be enucleated. During its extraction the swelling burst, and foul-smelling pus escaped. As much care as possible was taken to prevent infection of the surroundings, the pedicle was ligatured with catgut, and the abscess sac removed. The left ovary was embedded in adhesions, was enlarged, and contained a cyst filled with gelatinous material. This cyst was excised, and the cut surfaces of the ovary stitched with fine catgut. The left tube was congested, but appeared healthy in other respects, so ovary and tube were left.

The pelvic basin was now shut off from the peritoneal cavity by gauze packing, Douglas' pouch was opened from below, the pelvis was lowered, and the cavity thoroughly flushed with sterilized water. A pack of iodoform gauze was then introduced into Douglas' pouch, and the lower end carried into the vagina. This was done to check oozing and to drain. The patient's recovery was easy and uneventful. There was no rise of temperature, except on the sixth day—the day before the packing was removed—when it reached 99°.

Case II.

Removal of pyosalpinx of right side and hydrosalpinx of left side—Fouling of peritoneum during operation; downward irrigation through the vagina—Recovery.

Mrs D., æt. 27, married nine years, has had no children or miscarriages.

Complaint.—Pain in the right side and back, and down the right leg. Menstruation is irregular, lasts from seven to twelve days. Dysmenorrhœa is very severe, especially during the first day of the period. Micturition is frequent and painful. Her general health has never been good since marriage. She has lost flesh during the last three months. Her right leg swells when the pain in her right side is at its worst.

Operation.—25th January 1900. Cœliotomy. Patient in Trendelenberg position. The pelvic roof was found covered over by adherent omentum, which was divided, and the abdominal cavity then packed off. A swelling the size of an orange lay behind the right broad ligament and uterus, and extended low down into Douglas' pouch, being firmly incorporated to pelvic wall, uterus, and pouch of Douglas. In bringing up the swelling it burst in two places, and half an ounce or more of pus escaped. The pedicle was very broad and thick, and was ligatured with catgut. The swelling was composed of tube and ovary. The left ovary was large, cystic, and adherent to bowel. Its consistence was so soft that it broke down when handled. It was removed along with the tube, which was dilated and contained serum. Considerable oozing, chiefly from the posterior surface of the uterus, was stopped by the cautery. The pelvic cavity was now thoroughly washed out as in the preceding case. A gauze pack was pulled through the vaginal opening and the pelvis tightly packed. Catgut was used throughout the operation, and the abdominal wound was closed in layers with the same material. The patient was in poor condition before the operation, and at its close was so exhausted that saline injections were made below the breast; but her recovery was uneventful, the temperature never once rising above normal.

Dr Ballantyne thought that Dr Brewis had done good service in describing such a satisfactory method of peritoneal irrigation; it seemed to him as the last step in the specialisation of abdominal irrigation for those much-to-be-dreaded pus tubes which tend to burst on handling. A great many years ago he had seen practically the same method employed during an abdominal section for suppurative hæmatocele. He regarded it as the best technique.

Dr Haultain said he considered this a very valuable paper on a most important subject. Effused blood on the peritoneal cavity did not seem to be an indication for washing out. He now paid little or no attention to the presence of blood in the peritoneal cavity, if aseptic it was innocuous and readily absorbed, specially when mixed with normal saline solution.

The method of flushing through the posterior fornix he had, as the President would remember, adopted some years ago, prior to drainage in the same direction. He thought that the question of drainage could not be separated from that of flushing. In a paper he had read at this Society eighteen months ago he specially dwelt on the importance of draining cases of ruptured pyosalpinx through the posterior fornix, and he believed that the main feature in the successful issue of the two cases Dr Brewis cited was the drainage, not the mode of cleansing. He could well remember a fatal case of laparotomy he had in which he drained through the abdominal wound. Since that time, now four years ago, he had drained three cases through the fornix where pus had escaped during liberation of the tubes. Each had done well. He had never tried flushing the pelvic peritoneum through the fornix alone. Whenever he made a hole in the fornix he always drained.

Dr Stuart Nairne, *Dr Ritchie*, *Dr Foulis*, *Dr Fordyce*, and the *President* also made remarks.

Dr Brewis thanked the Fellows for the reception given to both his papers. In his second communication the method of cleansing described by him was not brought forward as a substitute for drainage, but as a way by which the contaminating material can be washed out of the pelvis without fear of being distributed among the intestines. When he drained, which was seldom, he did so through the vaginal roof.

X. CLINICAL NOTE ON A CASE OF ECLAMPSIA AT THE SIXTH MONTH OF PREGNANCY, TREATED BY SALINE INFUSION AND VERATRUM VIRIDE.

By J. W. BALLANTYNE, M.D., F.R.C.P.Ed., Lecturer on Midwifery and Gynæcology, Medical College for Women, Edinburgh; Assistant-Physician to the Royal Maternity Hospital, Edinburgh.

ON several occasions lately the subject of the treatment of eclampsia has been brought before the notice of the Edinburgh Obstetrical Society. The present clinical note breaks no new ground; it simply adds one further observation to the cases which have been brought before the Society by Dr Robert Jardine of Glasgow, in which the chief means of treat-

ment has been the hypodermic injection of saline infusions under the breast.

I was called into consultation to see the patient, who was under the care of Dr John Stevens of Merchiston, on May 18. She was thirty-nine years of age; had suffered from no renal trouble previously so far as was known, but had, according to her mother's statement, always had a "weak back"; she had scarlet fever when two years old. Her first pregnancy took place three years ago, went to the full term, and ended in a normal labour; during it there was no dropsy or other abnormal symptoms, but as the patient was not then residing in Edinburgh full details of the confinement were not obtainable; the child was born alive but died in three days thereafter, from "blood-poisoning" it was stated. The present pregnancy, her second, had reached the sixth month, when Dr Stevens was hurriedly summoned to see her on account of fits. She had only just arrived in the district, and Dr Stevens had not previously seen her. This was on the morning of 18th May 1900. For a week previously she had noticed that her urine was unusually pale, and for about a month had suffered from some swelling of the legs. At three o'clock in the morning she awoke with a severe pain in the epigastrium soon followed by violent headache. At 6 A.M. the first fit occurred, and thereafter a convulsion took place about once in each half-hour, the patient partially regaining consciousness between the attacks. These continued till 8 A.M., when Dr Stevens saw her; she was then in a state of coma, and the pupils were contracted to the size of pin-points. At 9.30 two drachms of magnesium sulphate were given by the mouth, a convulsion almost immediately supervening; then an injection of chloral hydrate, 20 grs., and potassium bromide, 40 grs., was administered per rectum. No convulsion then occurred for an hour and a half, and it was during this interval of freedom from eclamptic seizures that I first saw the case. The urine passed during the preceding night, before the supervention of the eclampsia, was pale, slightly turbid, sp. gr. 1014, albumen very copious (deposit of about $\frac{2}{3}$). There was no blood reaction, and the microscope showed nothing.

At ten o'clock I saw her. Her pulse was 136, of high

tension, and she was nearly quite unconscious. The cervix was undilated. Digitalis fomentations were applied to the loins and hot bottles were placed around her. A few minutes past eleven o'clock another convulsion took place, typical of eclampsia gravidarum in all respects. Ten minims of the tincture of veratrum viride were then injected hypodermically; soon afterwards the pulse was 124, and before half-past eleven it was 100. About twelve noon I slowly injected between a half pint and a pint of saline infusion into the loose tissue below both breasts. Two convulsions occurred soon after, and 15 minims of tincture veratrum viride were given hypodermically. Several ounces of urine were drawn off about this time by catheter, the patient being quite unconscious; it contained blood and a very large amount of albumen, more than two-thirds but not quite three-fourths, and under the microscope numerous epithelial and granular tube casts were seen. The convulsions, it ought to have been stated, were controlled by the inhalation of chloroform.

The condition of the patient was now manifestly so grave that further measures had to be considered, and after discussion we decided to induce therapeutic abortion. Of course this meant also to perform fœticide, for the fœtus was alive, and being only at the sixth month could not be expected to survive its transference from an intra-uterine to an extra-uterine environment; yet we regarded the fœticide as justifiable, for if abortion were not induced it seemed certain that the fœtus would perish with the mother, and if it were induced then it would die also but the mother might survive. At least such was our reasoning at the time.

I accordingly commenced to induce abortion about 1 P.M. I could get one finger easily into the uterus, but the internal os was undilatable, and the second finger could not be introduced even after half an hour. Neither the Champetier de Ribes' bag nor the Barnes' bag that I had with me would pass the internal os. Nevertheless uterine pains began to occur and continued to occur, but at long intervals, so I decided not to force labour, especially as there had now been an interval of two hours and a half since the last convulsion. The vagina was douched and a bougie fixed in the cavity of the uterus.

A convulsion occurred at three o'clock, and another at five; on both these occasions 10 minims of the tincture of veratrum viride were given, and on the second occurrence 20 grs. of chloral and 40 grs. of bromide of potash were also administered by the rectum. The pulse was now 112 and the temperature 99°, and no further fit occurred till eight o'clock, and that was the last one. Another rectal injection of bromide and chloral was given, and the bougie was left in the uterine cavity. Labour progressed very slowly during the night. At 4 A.M., May 19, 2 drachms of sulphate of magnesia were given by the mouth; the bowels moved once shortly afterwards, and again at 8.30 A.M. freely. At 9.25 A.M. the temperature was 98·4° and the pulse 96. The uterine bougie was removed, and it was found that the os uteri was now the size of a four-shilling piece. The patient was conscious and was taking hot milk and water with sodium bicarbonate in it and imperial drink. The skin was moist.

At 1 P.M. (May 19) the bowels moved again, and at 2 P.M. the fœtus was born (head presentation) and lived for some little time. The placenta was easily extracted; it did not appear abnormal; there was very little hæmorrhage. At 3 P.M. the temperature was 98·8° and the pulse 88. The urine passed in the evening, on boiling, showed albumen about one-half. The patient had a good night, and next morning (May 20) the urine was found to give albumen about one-sixth, blood still present, microscopically casts (granular and hyaline with a few epithelial), pus cells and blood corpuscles. Along with the diminution in the albumen it was noticed that the casts were fewer. During the day the skin continued to act freely, the mental condition was quite satisfactory, and both at mid-day and in the evening nearly a pint of urine was passed. On May 21 the urine was not so turbid as it had been, it was about normal in amount, and there was a small quantity of albumen. On May 22 the breasts were somewhat swollen and painful, and were accordingly firmly bandaged. The urine was rather more turbid and the amount of albumen was slightly increased, being about one-eighth. In the evening the urine was clearer and paler and showed less albumen; it had still a slight blood reaction, there were no casts, but there were some pus cor-

puscles and a few blood cells, also several large spiculated balls of urate of sodium. On May 23 the condition of the breasts had improved, and there was good and steady progress; the urine contained less albumen, a slight blood reaction was evident, and there were some pus cells, a few blood corpuscles, some balls of urate of sodium and some uric acid crystals. On May 24 the improvement continued; on May 25 there was only a trace of albumen, and no blood reaction; on May 26 the patient got some light milk food; on May 27 there was still a trace of albumen, and so also on May 29; and on June 3 the urine was normal. Since then the patient had steadily progressed and is now convalescent.

Remarks.

The case just narrated was a typically severe one of eclampsia gravidarum: there were in all about fifteen convulsions between six in the morning and eight in the evening, and the urine was loaded with albumen and contained also blood and tube casts. The recovery was most encouragingly complete, and taking into account all the circumstances, wonderfully rapid. It has to be noted that the hypodermatic injection of the saline infusion was not the only means of treatment employed; the convulsions were controlled by chloroform, the tincture of veratrum viride was injected up to forty-five minims, rectal injections of bromide and chloral were given, magnesium sulphate was administered by the mouth, and the induction of abortion was carried out. Doubtless all these measures played their part in achieving the satisfactory terminal result; but in attempting to distribute justly the praise, it is important to remember that the cessation of the convulsions and the general improvement in the patient's condition occurred eighteen hours before the birth of the living fœtus. Indeed uterine contractions were few, far between, and ineffective till the morning succeeding the day of the patient's illness. Further, the fœtus was born alive, and therefore it is not permissible to invoke fœtal death as a cause of the cessation of the fits. On the whole I am inclined to give most of the credit of the improvement which took place to the saline infusion and the tincture of veratrum viride; but doubt-

less the chloral contributed also to the result, and possibly the progress of labour, although extremely slow, by emptying the uterus, made the final recovery complete.

The supervention of eclampsia or of other grave maternal states due to pregnancy before the period of viability of the fœtus is, according to the teaching of the modern French school of obstetricians,[1] the only real indication for the performance of medical or therapeutic or prophylactic abortion, for the operation has been known by all these names. Narrowness of the pelvic canals, however great, is not any longer regarded as a sufficient indication for therapeutic fœticide—the induction of premature labour, when the fœtus is of course viable, does not come into this category of cases—for the development of the operations of the Cæsarean section and of symphysiotomy has made it possible to deliver the mother of a living child with a working minimum of danger to herself. Even in the case which has been narrated it will remain in my mind as an unsettled speculation whether the fœticide, for so it turned out to be, was justifiable. Had I desisted from interference after the giving of the saline infusion, might not the pregnancy have gone on till at any rate the fœtus was viable? I am inclined to think not, but I cannot say so with assurance.

An interesting point with regard to the power of the urine of the eclamptic to resist putrefactive change may be noted. Some of the urine passed the night before the convulsions appeared was obtained; it contained albumen, no blood, and no tube casts; and it was tested and set aside in a corked bottle with no special precautions (No. 1). The next specimen was that drawn off by catheter at the time when the fits were at their worst; it contained albumen, blood, and tube casts; and it was treated in the same way (No. 2). The next urine obtained was after the delivery; it still contained albumen and casts in large amount; it also was placed aside in a corked bottle (No. 3). The next four specimens, representing the urine of the next four days, during which the abnormal constituents were gradually disappearing (Nos. 4, 5, 6, and 7), are

[1] Pinard, A., "De l'avortement medicalement provoqué," *Ann. de gynéc.*, vol. li., p. 1, Jan. 1899.

now, more than three weeks afterwards, all alkaline in reaction, and are showing signs of decomposition; and the specimens taken still later, which are from a week to two weeks old, all show more marked evidences of decomposition. The first three specimens, however, which are of course much older than the others, are all acid still: the first one passed before the fits, although acid, is now beginning to show slight signs of decomposition; the second one, drawn off during the convulsions, is quite undecomposed still, although nearly a month in bottle; and the third one, which is also acid, is equally sweet. It would seem from these facts, which were carefully noted by Dr Stevens, that the urine passed during and immediately after the eclampsia (and to a slightly less degree before the fits also) was not a suitable medium for the growth of the moulds and spores which usually quickly form on the surface of urine put aside in non-sterilized bottles.

The *President* and *Dr Foulis* made remarks.
Dr Ballantyne replied.

XI. KRAUROSIS VULVÆ.

By J. A. C. Kynoch, M.B., F.R.C.P.Ed., Professor of Midwifery, St Andrews University; Obstetric Physician, Dundee Royal Infirmary.

In 1875 Lawson Tait described an atrophic condition of the nymphæ occurring most frequently at or about the climacteric; of long duration, frequently associated with urinary trouble, and finally terminating in extreme contraction of the vestibular opening. The affection first manifested itself on the inner surface of the nymphæ in the form of red tender spots disappearing and reappearing in different areas, and from its mode of extension termed by him "serpiginous vascular degeneration of the nymphæ."

Herman more recently writing on vaginismus and allied disorders, regards this condition as identical with that described by Breisky ten years later under the name of kraurosis vulvæ. Breisky observed twelve cases differing, he thought, from pruritus on the one hand, and the ordinary senile atrophy of

the vulva on the other. Those cases were characterised by deficiency of the nymphæ, a white, sodden appearance of the skin, obliteration of the normal integumatory folds, and terminating in vaginal stenosis. Since Breisky's publication about fifty cases have been reported, most of them confirming the clinical description given by him, but differing somewhat as to the exact pathological changes.

As regards symptoms, the itching and scratching of pruritus are the first generally noticed, and if long continued and unrelieved they are followed by a shrinking of the superficial tissues of the vulva and a dry, white appearance of the skin, the epidermis being frequently thickened and rough. The parts about the clitoris are most frequently first affected, the skin round the anus being last attacked. When this latter stage is reached a sensation of tightness about the vulva is complained of, the pruritic symptoms become less marked, the stenosed condition of the vagina remaining permanent.

Nothing definite appears to be known as to the cause of this affection, most cases occur at the climacterie, Breisky and Hallowell, however, reporting cases observed during pregnancy. Leucorrhœal discharge, syphilitic ulceration, and gonorrhœa are occasional but not constant accompaniments.

Perhaps the most interesting question, and one on which there is diversity of opinion is the relation which this affection bears to pruritus. Veit, in a recent criticism of this disease, regards the two conditions as closely allied. Prolonged itching and scratching produce alterations in the skin of an inflammatory nature, terminating, if unsuccessfully treated, in shrinking and atrophy of the skin. Cases observed when in the atrophic stage may be accounted for, Veit thinks, by the patients enduring the inconvenience of the itching and scratching rather than seeking medical treatment, whereas the successful treatment of pruritus, when localised and at an early stage, prevents the occurrence of the atrophic condition with the picture of kraurosis.

The want of unanimity in the description of the microscopical changes may probably be due to the affected part having been examined at different stages of the disease, or the

affection in certain cases being more advanced in some areas of the vulva than others.

Tait described the condition as a progressive atrophy, the last tissues affected being the vessels and nerves. Breisky finding the papillæ homogeneous, rete malphigii thin, sweat and sebaceous glands absent, regarded the condition as essentially atrophic, and Fischels, from an examination of six cases, corroborated Breisky's description.

Orthman, from an examination of Martin's cases, describes two stages: (1) Inflammatory (hypertrophic) stage characterised by small celled infiltration of the papillæ and corium, with thinning of the rete malphigii, so that the corium approaches the surface; (2) Atrophic stage characterised by a homogeneous condition of the corium, absence of glands, the small celled infiltration being confined to the subcutaneous layers.

Baldy likewise found the epidermis, corium, and subcutaneous tissues hypertrophied in certain areas, so that the different layers of the cutis could be differentiated with unusual distinctness, contrasting with a blending of the different layers and absence of glands in the atrophic areas.

Peters describes the condition as a diffuse connective tissue hypertrophy of the skin with a tendency to scar-like shrinking, and Heller, from the examination of a case of ten years' standing, finds no evidence to support the theory of a primary hypertrophic, terminating in an atrophic condition, but regards the change as a chronic inflammatory one extending deeply into the skin, so that muscles, glands, and fat, become atrophied, the more superficial structures from their better vascular supply remaining in a condition of hypertrophy.

The following are the notes of a fairly typical case of this somewhat rare affection:—

Patient 63, married at 23, 3 children, no miscarriages, menstruation regular, menopause at age of 48. Had always good health till six and a half years ago, when she complained for the first time of itching at the vulva, for which she received various lotions with temporary benefit. She came under my observation for the first time four years ago complaining of itching and a burning sensation at the vulva, difficulty in micturition, with shooting pelvic pains. On examination at this time there was

[*Face p.* 205

little to be made out beyond a small urethral caruncle and a few red tender spots on the mucous surface of the vestibule. The urine was free from sugar or albumen. There was little leucorrhœal discharge, and pelvic examination showed nothing abnormal. She was treated with bromide of potassium and carbolic lotion (1·20) locally, but left the hospital soon after admission.

She was next seen two years later, complaining of her old symptoms, and examination now showed extensive excoriations, the result of repeated scratching, from which she received temporary relief from the application of chloroform with almond oil, but her residence in hospital being again short she left little improved. The only treatment she used after leaving hospital was bathing the part with hot water, and when she again came under observation six months ago complaining of a feeling of constriction about the valva, examination showed the appearance typical of kraurosis. (See photo.)

The clitoris was represented by a small depression, the nymphæ had completely disappeared, and the vaginal opening so contracted as only to admit one finger. The skin of the affected area had the appearance of that produced by prolonged application of a moist dressing.

The treatment now adopted was complete removal of the affected area as recommended by Martin, and suturing the healthy skin margin to the mucous membrane of the vagina.

The result, so far, is relief of the pruritic symptoms, but continuation of those associated with the contraction of the vaginal orifice. Sections (in paraffin) of the diseased skin showed complete absence of all glandular structure, flattening of the papillæ, with thinning of the rete malphigii.

(I hope on another occasion to place before the Society sections cut in celloidin showing the more minute microscopic changes.)

The case would appear to support the view held in this country, that kraurosis of the vulva described by Breisky is identical with the terminal stage of the disease previously described by Tait, and that its relationship to pruritus may be one of direct cause and permanent effect, as pointed out by Veit.

NINTH (SUMMER) MEETING, JULY 11, 1900 (held in the Royal College of Physicians).

Dr R. MILNE MURRAY, *President, in the Chair.*

I. Professor Sängu of Prague, and Professor Fehling of Halle, were unanimously elected Honorary Fellows of the Society.

II. DISCUSSION ON THE TREATMENT OF DYSMENORRHŒA.

Dr Haultain opened the discussion by reading the following paper:—

There is no subject which is more fitted to be discussed at a meeting such as this, than that which I have the honour to bring before you, viz., the treatment of dysmenorrhœa.

To family doctors it is a symptom for which advice is constantly desired, while with gynæcological specialists it bulks largely in their consultations. At the same time there is perhaps no more debated question than the cause of the condition, and when and how it is to be treated.

It is well, therefore, that such an opportunity presents itself to enable us to discuss the widely divergent views entertained, so that if possible our independent attitudes may tend to greater harmony as to the method to be adopted of dealing with sufferers from this common disorder.

From a professional standpoint dysmenorrhœa may be defined as "pain associated with and dependent upon menstruation, of such severity as to materially interfere with the sufferer's performance of her usual duties." As a rule the pain is local and pelvic, but in certain cases is referred to the head, stomach, and other organs; these latter, however, do not call to be considered on this occasion.

From the frequent presence of more or less discomfort along with menstruation, the lay mind has come to consider pain as a physiological attribute of the function, and some writers have even gone the length of ascribing to it the rôle (along with labour pains) of being the inheritance of original

sin. Naturally therefore by a process of insidious aggravation, discomfort passes into pain, and true dysmenorrhœa of an exaggerated form is frequently taught to be borne with Christian resignation, as a gift from the gods, which it is wrong, even if possible, to attempt to ameliorate. Many young women are thus allowed to struggle through the most active years of their existence, at the commencement of each year carefully deleting from their diary two or three days every month when they are to be *hors de combat*, the supposed martyrs of their original parents' indiscretion, or of the sickly sentiment of their more immediate ancestors.

I would like, therefore, at this point to state that dysmenorrhœa, or in other words, pain at the menstrual periods sufficient to interfere with a woman's usual vocation, is to be considered at all times pathological, and is usually due to local abnormal conditions.

The causes of dysmenorrhœa do not fall to be minutely considered in the discussion before us, but in opening the subject, some reference must be made to them so as to offer a foundation upon which lines of treatment may be based. I shall therefore treat this aspect as shortly as possible.

As is well known, every author has his own classification of causes, and in the majority of cases they abound in varieties. Practically, however, they may briefly be considered as inflammatory and obstructive, alone or combined.

The inflammatory variety embraces congestive and inflammatory conditions of any of the organs physiologically concerned in the function. These are the uterus and its appendages. While the "obstructive" necessarily is confined to morbid states of the uterus alone.

A rational explanation of the pain in the latter is, that the blood which escapes from the capillaries of the uterine mucosa is impeded in its escape from the uterus. This may be by a temporary state of spasm, or by a permanent blocking of the uterine canal through flexions, new growths, or developmental stenosis. The obstructed flow naturally causes distension of the uterus from retention of blood which may or may not coagulate in the uterine cavity, and which stimulates forcible contraction of the organ for its expulsion. As the

result of uterine distension and contraction pain is complained of.

When the pain is inflammatory, it is due to the vascularity which occurs before menstruation still further congesting the already inflamed tissues; the discomfort is necessarily diminished after the depletion which occurs during the flow.

Clinical features.—Dysmenorrhœa may, from a clinical standpoint, be considered as of two main types—menstrual and pre-menstrual. The former is the association of pain with the flow, the latter before the flow. As might be expected, they may both be present.

When one reflects on what has already been said with regard to the causes, it will be at once apparent how readily these clinical types can be accounted for. Thus, when obstruction alone exists, the pain must necessarily only occur at the time of, or immediately before, the flow; while, in the inflammatory variety, the pain will be most pronounced during the period of congestion before the actual flow occurs. Should the inflamed organs be confined to the appendages, the depletion acquired by the flow occurring necessarily gives considerable relief; thus, the so-called ovarian or tubal dysmenorrhœa is mainly pre-menstrual in its character. On the other hand, in uterine inflammation, such as endometritis, the pain, though pre-menstrual, may be continued through the period by the contractions of the tender uterus, or by the thickened and swollen diseased mucosa offering a block to the easy exit of the menstrual blood. In the same way congested or inflamed ovaries, with endometritis, will give rise to the combined types of pre-menstrual and menstrual dysmenorrhœa. From a very considerable experience, I have found the obstructive or menstrual variety to greatly preponderate as the initial type. I should say quite 10 to 1. But what must not be overlooked is the fact that the primarily purely obstructive tends in due course to become associated with the pre-menstrual or inflammatory, the latter being a secondary result of the former. The almost everyday clinical picture might here be quoted. The young woman of twenty-five (perhaps more often married than single) complains of pain before and during her periods. From the establishment of the

function she has had pain, at first menstrual and tolerable, which could be combated with hot whiskies and other handy remedies, but it has gradually increased in severity. It now lasts longer, and commences before the flow, and is frequently associated with a pain in the side, more or less constant, and sometimes with increased blood loss (menorrhagia), which reduces the patient to semi-invalidism. If married, she is sterile. The household alcoholic specifics are now inefficacious, and nepenthe and chlorodyne are ruining her digestion. The diagnosis is almost assured without examination. He who runs may read. Primary obstruction, secondary endometritis, and perhaps ovaritis!!

Treatment.—This, the main subject of our present discussion, devolves itself into the consideration of two main questions. 1st. Are we able to cure or ameliorate the condition? If so, how? 2nd. Is it justifiable to adopt local treatment with the methods at our disposal? The first heading may be answered usually in the affirmative. In its consideration one naturally must direct attention to the very different causes of the symptoms, and act accordingly. Thus, in the obstructive variety, common sense teaches us that removal of the obstruction must be the object aimed at. If a displacement, it must be rectified; if a new growth, removed; and if a stenosis, the dimensions of the canal of exit must be increased.

By far the most common causes of this type are stenosis and flexions, the latter being usually a congenital anteflexion, though retroflexion may be present in exceptional instances. In retro-displacements, replacement and retention in position is the only method to be adopted; but these, from their rarity, require no further comment.

It is the congenital anteflexion with stenosis which accounts for the great majority of cases of dysmenorrhœa, and it is to this I shall chiefly direct attention. As is well known, vaginal supports are practically valueless in anteflexions, and uterine stems are dangerous to use, therefore our treatment in these cases as in stenosis is to dilate or incise the uterine canal to such an extent that mechanical obstruction is removed.

Dilatation may be accomplished in two ways, forcible and gradual. Forcible is performed by a series of bougies of in-

creasing size which are rapidly introduced in succession, or by means of branching dilators, Sims or Ellingers, which after introduction are forcibly expanded.

Gradual dilatation may be performed by means of tents or bougies introduced in a manner similar to that of dilating a stricture of the male urethra. In my own experience I have found the use of the tent, or the forcible dilatation by bougies up to 15 French or 10 Hegar most efficacious; but in the majority of aggravated cases, as has been shown, there is present a coincident endometritis, which curettage with subsequent hot vaginal douching materially assists in effecting a more rapid and permanent cure.

Incision of the cervix is not now so frequently adopted as formerly, but in well-marked cases of stenosis is of much value in establishing a permanent dilatation of the cervical canal. Should it be performed care must be taken to keep the incision open by artificial means for forty-eight hours after the operation. For this purpose I have found a strip of iodoform gauze most useful.

The treatment of the menstrual variety of dysmenorrhœa by means of drugs has in my hands been most discouraging, a result natural to expect if we assume the cause to be a mechanical obstruction. This explanation of dysmenorrhœa, as shown by the beneficial effects derived from dilatation, I unhesitatingly uphold as the only practical explanation of the origin of the pain, conversant though I am with the many other elaborate theories propounded by authors on the subject. By drugs all that can be hoped for is a temporary alleviation of the symptoms; even if this could be attained in a harmless manner much might be said in favour of the treatment. Unfortunately, however, the medicinal treatment resolves itself into the exhibition of stimulants or anodynes, both of which are objectionable from their deleterious effect on the general health and morale of the individual. There is no gainsaying the fact that many a dypsomaniac and morphomaniac can trace the origin of their degradation to the comfort gained by alcohol and opium during painful menstrual periods.

In the inflammatory and congestive forms, particularly those due to ovarian causes, sedatives such as bromides, gelsemium,

camphor, and hydrastis find most favour, combined with hot applications, hip baths, and counter-irritants. Scores of drugs are recommended, which is the most certain testimony of their inefficacy. When primarily ovarian in origin such means are alone at our disposal; fortunately, however, primary ovarian mischief is the exception. When the ovary is implicated it is usually secondary to uterine causes, and if not allowed to become too chronic, as a rule subsides after the uterine condition has been satisfactorily treated.

When the ovarian condition is intractable it is in rare cases found necessary to perform oophorectomy. Fortunately such is a great exception, and is only applicable when from special reasons it is imperative that the dysmenorrhœa be removed.

On the present occasion the point which is of prime importance, and which I trust will be most thoroughly discussed, is the justification of the local treatment of dysmenorrhœa.

In considering this all-important question one must first divide our patients into married and unmarried. In regard to the first group there can, I think, be no divergence of opinion that local examination, and if need be treatment, should in all cases be carried out.

With unmarried females, on the other hand, our lines of conduct are by no means so clear. In treating this subject one feels they are treading on delicate ground. The fine thread of sentiment is so intimately entwined with the stronger cord of duty, that it is almost impossible to separate them without breaking the former inadvertently or voluntarily cutting the latter. Yet it has to be boldly faced; and if from the discussion a definite conclusion can be arrived at, much will have been acquired.

In attempting to place the main points of this important aspect of the discussion before you, I should like again to emphasise my former definition of the term dysmenorrhœa as a condition which materially interferes with the sufferer's duties. I would also like to again state that my experience guides me in affirming that in the vast majority of instances the pain is due to local pathological conditions which are curable. Being clear on these points, one has now to differentiate our unmarried patients into two groups: 1st, those who require by

their own exertions to maintain themselves; and, 2nd, those who are affluent and do not require to work.

Those in the first group cannot afford to lie up a day or perhaps two monthly; their dysmenorrhœa prevents them taking or keeping good situations. Relief must be obtained. Sentiment cannot be considered, as there is as yet no philanthropic society for the upkeep of dysmenorrhœic women.

The second group are under very different auspices. They can if they so please afford to lie in bed encircling a hot bottle, and by means of stimulants and anodynes, pass twenty-four or forty-eight hours every month in more or less comfort. All they miss is some social engagement or evanescent pleasure.

It is the treatment of this class which must form the main theme for discussion; they are those with whom we are in more intimate social relation, and naturally therefore with whom our sentiment is more apt to predominate.

The question pre-eminently to be faced is: are we to allow for merely sentimental reasons these young women to suffer, if they desire to be cured? Personally I cannot consider with favour any such line of action. My line of treatment is to examine them locally under an anæsthetic, and at the same time be prepared, should dilatation, uterine reposition, or curettage be indicated, to perform the necessary manipulation there and then.

Among the many sentimental objections one of the most common is that local manipulation directs attention to the sexual organs. I should very much like to know if being *hors de combat* every month during the sexual function will not be more potent in the same direction. I cannot conceive any argument in favour of allowing dysmenorrhœa to continue. It is said, and with truth, that it may improve spontaneously. So does fissure of the anus! Yet it is treated whenever complained of. In the majority of instances the menstrual pain tends to become aggravated as time goes on, and further, of more importance, as I have frequently noted from observation, tends to set up ovaritis which is most intractable and often incurable. Why therefore allow it to continue? Is there any real objection to treatment in the manner I have indicated?

In the married woman local treatment is routine. In the poorer classes it is essential. Why is it condemned in the affluent? If we are to be sentimentally consistent, the sooner a philanthropic society such as I indicated is started the better. There can be no excuse for material reasons alone to disturb the morale of the industrious woman by directing her attention to her sexual organs through local treatment to obviate pain. Doubtless each individual case is presented under different aspects: we as medical attendants are there to advise not to insist. What position are we to take up? Are we to go on treating by drugs which are not only useless in curing the condition but are often harmful, hoping that in due course a spontaneous cure may take place, or as I have so frequently heard repeated, to tell the mother "that when her daughter gets married she will be cured if she has a baby." Comment on this latter prophetic prognosis is almost superfluous were it not so common. I can only say, however, that the great bulk of primary sterile women who have passed through my hands are the subjects of dysmenorrhœa, and in those in whom the sterility has been cured it has only been when local treatment, such as has already been indicated, has been adopted and the dysmenorrhœa removed.

To parents the idea of local interference is repugnant; but there are happily few who, if they know that much can be done on these lines to lessen the sufferings of their daughters, will from *minauderie* veto its attempt. The medical attendant is the counsellor; it lies practically with him.

Personally, I consider that in all cases where simple drugs have failed to relieve the condition, a local examination under an anæsthetic is the correct mode of procedure, the examiner being prepared there and then to treat any minor abnormality present.

I am no partisan to tinkering with the sexual organs, and I trust I am not debased enough to be devoid of sentiment. When, however, it runs riot with reason and is a direct menace to health and happiness, it ceases to exist and degenerates into prudery.

By local treatment such as I have described I have yet to see, hear, or read of an example where a patient has lost her

own self-respect or regard of her friends; on the other hand, I personally know many who through false modesty or ignorance have led a hampered existence which they bitterly regretted, when after rational treatment they had been cured and thus enlightened.

Dr Church said that prevention is better than cure. Therefore he should like to say a few words as to the duty of all guardians in being very careful of growing girls at the commencement of their menstrual life, and in avoiding all conditions likely to end in dysmenorrhœa. This took us back to the time when the girl was at school, and to the consideration of the too frequent neglect of the schoolmistress or parent in inquiring into the health, especially that which is of primary importance, her menstrual health. For upon the attention or neglect the girl received at the time of puberty, might depend the weal or woe of the future of the woman. From this point onwards for some years the girl required a care and medical supervision all her own. When they remembered the very sensitive nervous organisation of the female sex, and the wonderful physico-chemical changes that occurred in the uterus at, and prior to, menstruation, and the intimate relation to the nervous system which the whole reproductive apparatus of the female has, they could not, as medical men, give a too clear note of warning as to the importance of care in order to avoid the hidden rocks of danger ahead arising from indifference or neglect. How often it happened in these days of school pressure, that the education of the mind was carried on at the expense of the bodily health. Perhaps this occurred more in the city than in the country, and probably dysmenorrhœa was more frequent in city life. It was certainly true that dysmenorrhœa, and morbid functional neurosis arising therefrom, were more common in the cultured and educated classes than in the comparatively uneducated. This pointed to the desirability of a system of education less straining to the nervous system of the growing girl than it commonly was in many schools. It had always to be borne in mind that school-girls were highly emotional, and that the uterine periodic functions were remarkably subject to moral emotions. In school life,

with examinations and competitions, there was a more or less continuous excitement. Of course this applied also to the case of young girls in *any* kind of straining occupation. This excitement affected all the secretions of the body, both in quantity and quality. In the case of the uterus, the disturbance might show itself in dysmenorrhœa, probably due, as Dr Berry Hart has pointed out, to the deficient secretion from the cervix of that mucus which is believed to keep the blood of menstruation from coagulating. If from any inadequate admixture with this mucus, there is coagulation and clotting of the menstrual blood, there will follow spasmodic pain, and maybe sickness and retching. In order to avoid any undue excitement and conditions untoward to menstruation, it was his rule in practice to recommend, at every period, two or three days' rest on the sofa with the limbs up, or if there was pain, *complete* rest in bed, where it could possibly be done. Remembering that every menstruation may be regarded as a miniature labour, with rhythmical uterine contractions, these precautions were not too stringent in view of the many possible dangers and inflammations that might supervene at this time. These local inflammations of the uterus might arise from any lowered state of the health. They might also be auto-toxic in origin, from the intestinal or other mucous membrane, or they might follow the exanthemata. But the danger to which he wished specially to refer was rheumatism. The uterus and its appendages were as liable, perhaps even more so, to be attacked with rheumatism, as any other organ of the body. The pelvic pains complained of might not be ascribed to rheumatism, but they probably were rheumatic. If the fibrous tissue, for instance, at the os interunus becomes the seat of attack, rheumatic changes might occur, leading in time to an anteflexion and stricture. This anteflexion at the *period* was the cause of pain and spasm, by increasing the menstrual congestion above the constriction. It might appear theoretical, but such, he believed, was the explanation of *some* cases of dysmenorrhœa. Salicylate of soda generally gave relief. By carefully treating recurrent attacks of rheumatism, however slight, in girls reaching puberty, much might be done in the way of prevention. At present he had a case under his care

in which for two years before puberty the girl had a rheumatic affection of the throat and tonsils, with rise of temperature, every month. Since menstruation had become established she did not suffer from her throat. She had, however, slight dysmenorrhœa which with more care might have been prevented. Cases are not unfrequent in practice where an acute articular rheumatism had been ushered in by a tonsillitis. In like manner they met with uterine rheumatism accompanying and following a tonsillitis or pharyngitis. Boys occasionally had orchitis after mumps. In girls they might have an ovarian or uterine trouble from a similar pathogenic cause, the inflammation thus started being lighted up afresh at each menstrual period, and a neurosis brought about, very difficult to cure. Sometimes, too, in such cases, chorea is present, in the muscles of the face particularly. This pointed to a rheumatic cause. Here the rheumatic element would seem to be associated with a *uterine* rather than a *cardiac* disturbance, as in other cases of chorea. Surely, then, in the light of these considerations, they cannot be too careful in treating rheumatic and allied ailments in growing girls. Included in this aspect of treatment is attention to the nasal mucosa, removal of adenoids, etc. Granting that all care had been taken, on the lines indicated, at puberty, and still menstruation was painful, he would recommend his patient to have judicious cycling, or gentle horseback exercise, *between* her periods. This he would try before resorting to the drugs of the pharmacopœia, or to the dilator of the gynæcologist, or to any procedure likely to concentrate the young girl's thoughts upon her uterine ailment.

Professor Kynoch thought it was very important, when called upon to treat a case of dysmenorrhœa, that it should be remembered that they were dealing with a symptom, and that the pain is indicative of disease—uterine, extra-uterine, or perhaps both. In young girls he certainly did not think it advisable to resort to any local treatment without a prolonged trial of constitutional remedies. He believed that many young girls can be cured of their dysmenorrhœa by constitutional treatment; and that it was only when these means failed that local measures should be resorted to. No doubt

the question came into consideration as to whether they had to work during their menstrual periods—and in this case local treatment would have to be much sooner undertaken. With regard to the different methods of local treatment referred to by Dr Haultain—rapid or slow dilatation—his experience was that rapid dilatation had not been very satisfactory. He found that these patients came back in a very short time, and dilatation was necessary again. He had now entirely given up the rapid method, using a tupelo-tent, which he left in twelve hours; replacing it again for two subsequent days, and plugging the uterus meantime with sterilized gauze. This method was more tedious, but he found the results much more permanent. The objection raised to the tent was, of course, the possibility of septic trouble; but so far he had never seen any bad effects whatever. With regard to those cases associated with extra-uterine affections, most frequent in married patients who had been pregnant, and generally dependant he thought upon pelvic adhesions and ovaritis, he had seen good results from the continued use of the douche. He held that the douche as ordinarily practised—that is, the nozzle introduced with the patient in the sitting position—was practically useless. Patients would not stand the temperature which is necessary to have any influence upon inflammatory conditions. The return flow of the injected fluid causes so much inconvenience when passing over the skin that the patient cries out with pain, and the temperature has to be lowered, so that the douche ceases to be beneficial. He had found that by using an instrument introduced by Stratz, whereby the fluid can be injected at any temperature, the return flow not coming in contact with the skin at all, he was able to treat many of these inflammatory conditions to better advantage. If that failed, he had had satisfactory results, and also some unsatisfactory results, by opening the abdomen from the vagina. He thought that all could be done that was necessary by the vaginal route; adhesions could be broken down, ovaries inspected, etc., and the convalescence was generally very much better. As to removal of the ovaries he had had very little experience. In two cases which he had under observation just now, where the ovaries had been removed for pain,

But she had her periods without pain all her life. This was strange; yet the removal of the ovaries was constantly advocated. Was it not ignorance that led them to take the ovaries in one case and to leave them in another? He was in favour of all that was truthful; let us find out the true cause. He thought Dr Haultain had done a service in directing the attention of obstetricians throughout the country to this matter; but he would warn his fellow-practitioners against the tendency which prevailed at the present moment to use the knife on the poor ovaries. In his experience during the last twenty years the number of ovaries which had been taken out injudiciously was something to be deplored. He was strongly of the opinion that it was our duty to find out the causes of the pain at menstruation, especially if the pain interfered with the wage-earning powers of the individual; but he thought a warning was necessary against the tendency of the younger men of the present day to rush at once to the examination of those poor, delicate, neurotic females. He was quite in favour of an examination if every simple medical method had failed. If good came out of this discussion, no one would more rejoice than he.

Dr Connel, as a general practitioner of thirty-three years' practice, had seen a great many cases of painful menstruation, even in the healthy country. He was in accord with Dr Foulis' opinion, and would desire to emphasise that the very last thing he would do would be to make a local examination. He supposed that most of those present were specialists; but as an old practitioner he was strongly of opinion that they should never lose by respecting a woman's feelings—no matter how degraded and coarse she might be—and by showing in themselves the very highest regard for the feelings of the female. Even in the very poorest or humblest female interference with the sexual organs was the very last thing to be thought of. They should, however, remember the classes of patients as laid down by Dr Haultain—married and unmarried. It was, of course, a different thing with the married; and in dealing with sterility no time should be lost in intimating to the wife, and to the husband also, the measures that might be advisable. That kind of distress ought not to be allowed to go on. Every

practitioner will find it his duty, when other remedies have been tried and found useless, to indicate that their local means should be used; even the knife—the hated knife—if necessary. Of course removal of the ovaries should never be thought of in a young unmarried woman. He thought that perhaps Dr Foulis had taken too violent a view of this. From what he read he gathered that removal of the ovaries was now very much discredited—it was not so much heard about now; and he did not think, therefore, that a counterblast against the operation was required. But cervical dilatation by the methods mentioned by Dr Haultain and Professor Kynoch should be used without hesitation in the case of the married who are suffering. In the unmarried, no doubt the pain might arise from many causes; and he could recall dozens of cases of young women who had suffered severely in their menstrual periods, and who had got well somehow. He could not state the opinion too strongly, that he thought the introduction of the bicycle had had more to do with the removal of the painful menstruation than any other remedy he had heard of in late years. He agreed with Dr Church that it was of importance to watch carefully young girls, and thought their true function as general practitioners lay in teaching mothers to look after the health of their daughters—they often found, in perhaps three cases out of four, that there was a history of neglected constipation; this was a matter that Dr Haultain had not mentioned, though Dr Foulis had called attention to it. It had been said that many young girls might be called walking water-closets—it was at anyrate a matter which they were all aware was neglected by multitudes of parents, and it was associated with a great deal of the painful menstruation which existed. In the matter of remedies Dr Foulis had already called attention to iodide of potash, and amongst a good many others he would instance salicylate of sodium as an excellent remedy—if only for its anti-spasmodic properties. These two he would certainly try before cannabis indica or any other nerve sedative. Lastly he would desire to utter a very strong counterblast against alcohol in any shape or form; they often found that women who had turned out drunkards stated that the doctor had prescribed it as a remedy when they were young girls.

Unless as a very last resort they should not use alcohol. Only the Sunday before last he had been called to see a young married woman, aged 22, who was suffering from pain not quite menstrual, as the period had passed some days; but found that she had already imbibed three half-cupfuls of whisky, which he was shocked to hear had been recommended by a doctor, though this may not have been true; and her relatives had been in the habit of giving her this quantity of whisky at menstruation; she was practically drunk when he saw her. He had no doubt others saw the same thing in their own districts, and would say "whatever we give for dysmenorrhœa let us avoid alcohol."

Dr Malcolm Kerr (*Glasgow*) said the Society could hardly have chosen a more extensive subject for discussion than the treatment of dysmenorrhœa, seeing that the symptoms might be associated with almost every disease of the pelvic organs. On collecting the other day 64 cases, 20 of which had recently been under Professor Murdoch Cameron's care in the Western Infirmary, Glasgow, and the remaining 44 under his own at the dispensary of that hospital and in private practice, he found that excessive menstrual pain had been associated with the following conditions: Pelvic peritonitis and cellulitis, 4; metritis and endometritis, 6; endometritis exfoliativa menstruales (membranous dysmenorrhœa), 3; salpungitis, 3; myomatis of uterus (all small), 5; carcinoma of cervix, 1; polypi of uterus, 2; ovarian tumours, 5; cyst of broad ligament, 1; hæmatocele, 1; fibroid tumour of sacrum, 1; abnormally small uterus, 3; stenosis of cervix, 6; ante-flexion, 16; retro-flexion (both multipara), 2; morbid anæmia, 1; great nervous disturbance (hysteria?), 1; no cause found, 3. To discuss fully the treatment of dysmenorrhœa would involve therefore a consideration of all these diseases. But while that was true theoretically, the object of the present discussion was, he fancied, to consider, not dysmenorrhœa, the symptom, in general, but the cases where, owing to the lesions being so obscure, the symptoms had really to be looked upon and spoken of as a disease. Gradually they hoped such a class of cases would entirely disappear, and they would be as little justified in being satisfied with a diagnosis of dysmenorrhœa, as they

would be at present in making use of menorrhagia in any particular case where the latter was a prominent symptom. As one meets with dysmenorrhœa in practice, there seemed to him to be three classes of cases. He did not agree with those who divided the condition into the membranous, obstructive, spasmodic, and congestive. The membranous should be spoken of as endometritis, adding if it was desired the two adjectives exfoliativa menstrualis, and to speak of congestive dysmenorrhœa was absurd, for the pelvic organs were always congested before and during menstruation. The three classes into which he would divide cases of dysmenorrhœa were the following: 1. Cases where there are distinct lesions present, that as far as our knowledge goes, quite accounts for the pain, as, for example, inflammatory conditions of the pelvic organs, and certain tumours, etc. 2. Cases where although no lesions are present we cannot yet fully understand why they cause dysmenorrhœa. In this group he placed three conditions, ante-flexion and retro-flexion (as nullipara) without endometritis, slight stenosis of the cervix, mal-development of the uterus. 3. Cases where there are no discoverable lesions. It is often said that this group is a very large one. Personally he had not found it so. In only three out of the 64 cases he had mentioned could no lesion be found. Of course if ante-flexion and a slight degree of stenosis are included as the cause of dysmenorrhœa, as some would do, then the numbers in this group would at once become much larger. In the vast majority of cases, and certainly in all the most severe, a lesion more or less distinct exists in the pelvic organs. (As mentioned before only in 5 per cent. of the cases was no lesion found.) As a natural consequence local treatment is almost always indicated. In group 1, where the lesion is distinct, that lesion should be removed if possible, but return certainly, and the latter can always be accomplished. These inflamed tubes and tumours are excised, the uterus is curetted, and douching and the introduction of vaginal plugs is the treatment adopted. The line of treatment to be followed is quite simple, we are quite satisfied we know the cause, and we remove it to relieve it as far as possible. When, however, we come to the second group (cases of ante-flexion, stenosis of cervix, mal-development), we

are in a totally different position. We find a lesion, but we don't quite understand how it acts in causing the excessive pain. Consequently our treatment becomes partly empirical. The empirical treatment he favoured was dilatation of the cervix. Almost always he had found it relieve the pain. The relief no doubt often was at first only temporary, and the dilatation had to be repeated sometimes once or twice before a permanent cure resulted, but if they explained this to the patient, as he always did, she would be perfectly satisfied. The operation he always performed now under chloroform, with either Cameron's or Hegar's dilaters going up to a No. 6 Cameron or No. 9 Hegar. Dilating to a slighter extent repeatedly before the menstrual period he had not found so satisfactory. Personally he had had little experience of electricity in this condition, but in the hands of others he had occasionally seen some temporary benefit result. As regards group three, when there are no lesions to be discovered in the cases, our treatment of course is entirely empirical. A large proportion of the cases in this group, in all probability, are women who make a great fuss about very little pain, or feel pain very acutely. He was inclined to think that it was more often the latter. Such women are occasionally benefited by tonics. Personally he had had very little success with drugs, except when there was some discoverable disturbance apart from the dysmenorrhœa. The only drugs that he felt certain do relieve the pain sometimes are antipyrin, phenacetin, and others of a similar nature. He would fancy that the continuous current would temporarily give relief. When all other means fail he recommended dilatation of the cervix here also. Finally, as regards subjecting unmarried women to a vaginal examination, he failed entirely to see where there is any need for discussion. For if the ordinary treatment, regulating the bowels, improving the general health, and a fair trial of such drugs as iodide of potash, salicylate of soda, gelsemium, etc., fails to relieve the pain, then a thorough examination of the pelvic organs under chloroform is not a matter of choice, it is a duty.

Dr Barbour was of opinion that this subject raised one of the biggest questions in the whole of gynæcology—namely, the importance of pain as a symptom. He was not present at the

beginning of Dr Haultain's paper, and did not know whether he went into this point of the very great difficulty that one has in estimating the amount of a patient's suffering, on which of course hinges the necessity of operative treatment. The difficulty that one has is with the unemployed—he was not speaking of the unemployed of the East End, but of those of the West End. A great deal depended upon how the patient had been brought up. If she has been brought up to think a great deal about herself, and to magnify her ailments, she might suffer a great deal at her menstrual periods. If, on the other hand, she has been brought up to think more about others, and to work for them, that patient, he found, did not suffer so much. In estimating the amount of the pain, we should keep our attention on two factors—not only the stimulus to the peripheral end of the nerve, but the irritability of the sensory nerve centres. One of the largest benefits ever done to gynæcology had, he thought, been done by Dr Weir-Mitchell; and those who follow in his line might see a very great improvement in these cases by feeding-up the patient, and directing their attention to the condition of the central nervous system. It might be said that this does not apply so much in regard to dysmenorrhœa as to pain between the menstrual periods; but he thought it did. He thought that the patients found to suffer most from dysmenorrhœa were the neurotic, highly strung patients, and that these were also most liable to suffer pain between the menstrual periods. He thought that in speaking in a discussion like this one might perform a service by drawing attention to points which had not been sufficiently emphasised, and he wished to emphasise this point, that he disagreed with what Dr Haultain had said with regard to the various operations in these cases. He thought that if more attention was paid to the general condition of the patient, and he believed strongly in medical treatment, at any rate to use it for a few months until the patient improves. He might instance a couple of cases—one that came under his care in the beginning of last winter, sent in from the country to see whether some operation should not be done. The patient had a retroverted uterus, rather undersized, and some perimetritis which went back to a couple of

years ago, when she had suffered from some intestinal attack. Ordinary measures had been tried without relief. As the patient was unmarried, although she had been examined before, he had some hesitation about operative treatment, and proceeded on other lines, attending first of all very carefully to diet, and especially also to constipation, giving salines before the menstrual periods. He had given her antipyrin for four months, and a course of arsenic continuously for three months; and she reported the other day that she was feeling not quite well, but very much better than six months ago. He thought she would go on improving. Another case came to the hospital that morning, sent in to know whether the uterine appendages should not be removed. She had salpingitis and ovaritis upon the right side, and had been worrying her doctor in the country so much that he had sent her in. He had tried every means and failed, and the patient was herself keen on an operation when she came in. As this patient seemed a nervous one, he had gone into her diet for the last three years, and found that she had been gradually cutting off her food, so that now she was living upon a bit of toast and cup of tea for breakfast, another cup of tea at dinner-time, with perhaps a little fish; another cup of tea with a slice of bread and butter at tea-time. This had gone on practically for the last few years. Of course the line of treatment to be adopted was evident; and he had no doubt that general treatment in this case would relieve the pains.

Dr James Ritchie regretted that as he had unavoidably been prevented from being present until the discussion was far advanced, he was not in a very satisfactory position for taking part in it. He agreed with Dr Haultain's division of patients into two classes—married and unmarried. In the case of the married woman he found little difficulty, if he got sufficient indication, for the line of treatment to be followed. In the case of the unmarried woman, he did not think of making an examination until he had exhausted what seemed to be reasonable means of giving relief. Then, of course, if the patient goes on suffering, one had to put feelings aside; everything had to give way to considerations of health. It seemed to him that the difficulties met with were more in connection

with those cases in which really no organic change could be found, though it may be said that the changes found depended upon the ability of the examiner to some extent. In regard to these cases in which there was some organic trouble—first of all, flexions—he did not believe that flexion *per se* was a frequent cause of dysmenorrhœa. If they remembered the large number of women with flexions who do not suffer from dysmenorrhœa at all, he thought they were bound to acknowledge that something must be superadded, and they had got to treat that something. He believed that in a large number of cases it was of an inflammatory character—it might be a low type of inflammation—for which they should adopt the douche, and possibly the use of ichthyol. They did not often require to treat the displacement, except in very severe cases where the flexion is very acute. In another class of cases, where the ovaries are somewhat tender, the uterus enlarged, where there is a certain degree of menorrhagia, and in many cases sterility, he believed that even in these cases, by patient douching and the use of ichthyol inunction, one may get very marked benefit, and in some cases cure. He knew of two such cases, in which the patients were condemned to the removal of the ovaries. They were very unwilling to have them removed; and after careful douching twice a day with the use of ichthyol, both these patients recovered—they no longer suffered pain, and the other symptoms also disappeared. He did not mean that sterility was cured, but the patients passed their periods with a moderate degree of comfort. In the cases where one gets no organic change on examination, he had found dysmenorrhœa very frequently in girls suffering from anæmia; and on treating the anæmia, the suffering at the monthly periods was greatly benefited. Then, again, of rheumatic patients he had had several, both married and unmarried, who suffered in this way; and on treating the rheumatism, the monthly suffering had been markedly alleviated. Women occasionally suffer considerably from rheumatism of the uterine muscle during pregnancy, and the speaker believed that rheumatism is also a cause both of ovarian and of uterine dysmenorrhœa. Some time ago he had a rheumatic patient who suffered severely from the ovarian form, who was quite

cured by iodide of potash; about two years later she returned, suffering from severe pain in the uterus, which disappeared with the onset of the period, and returned with its cessation. Potassium iodide was given without benefit, but salophen was followed after a few days by complete relief of the pain, which had existed in varying degree for many weeks, except during the menstrual flow. He could not say that he had found so much benefit from dilatation of the os. He had had some of his patients treated in this way, and the result was not very satisfactory. Possibly Dr Kerr would say that it was not sufficiently often done; but it was done, and the patients were not cured. In one patient, at all events, who had the os dilated, and after she had had a child, although her suffering was less, she still continued to suffer pretty severely; and she still has the same kind of pain as formerly, which was supposed to be spasmodic dysmenorrhœa. But the large mass of cases in which one met with difficulty were those of women of nervous constitution; and he agreed with Dr Barbour and also Dr Kerr that the general health, and also education, had a great deal to do with the amount of suffering experienced. If you have a highly educated woman of nervous constitution, she may suffer much, because she has little to do, and thinks a great deal about her suffering. He had observed a few patients of this sort, who have had their attention taken off themselves—they have had to get up for a meeting or something of the sort, and they have evidently not suffered very much; whereas, if they had been at home they would have been in bed, and suffering very considerably. This class of patient also suffered a great deal more if they got into a low condition of health. He was sorry that the pathology of the condition was not nearly sufficiently studied. A line that he had formulated for himself in treating such cases was, that there was a periodical flushing of the pelvic organs every month, and that the nervous system and vaso-motor nerves have a wonderful influence over the amount, so that if the person is ill there is much more likely to be excessive flushing at that time from excessive dilatation of the blood vessels. There are certain sets of internal organs of which we are not conscious in a condition of health, but which, when they become slightly over-congested, immediately become pain-

ful. He thought that in a number of these cases there was excessive congestion of the parts, causing pressure on the nerve endings, and so producing pain—it might be in the ovaries or in the uterus, and if it was in the uterus, there was spasmodic dysmenorrhœa. In the treatment of this class of cases, he had found it a very distinct advantage to try by tonics and other means to keep up the patient's health to the highest possible pitch.

Dr Holmes (*Chicago*), had come there to learn what was being done in Edinburgh, not to tell what was being done on the other side. His own work also was largely obstetrical, so that he saw very little gynæcological practice, indeed he might say that the gynæcology that he knew was that of the Edinburgh school. He agreed with Messrs Hart and Barbour's work in many respects, and especially in regard to their section on dysmenorrhœa. He must take exception to Dr Haultain's idea as to the etiology of dysmenorrhœa. He did not believe in its production by the so-called "mechanical theory." It was years since he read Hart and Barbour, but he remembered that they also take exception to that view. The blood is liquid, and it will flow through a constriction of the os uteri as well as it will through the capillaries. Therefore the obstruction must be complete, or at any rate less than the size of the capillaries, to produce the obstructive form. When there is clotting of the blood intra-utero, it is another thing —then the obstructive theory does obtain. He had gone so little into the pathology of the uterus that he could not say what was the reason; but it might be, as one of the former speakers had suggested, that something in the cervical secretion prevents clotting, but when this is pathologically altered, then clotting will be produced in the uterus, and then only will the obstructive form take place, the pain being produced by the efforts of the uterus to expel the clot. He had been made to think of the subject of dysmenorrhœa from an obstetric case that he had some years ago—a phlegmatic German girl who had an illicit pregnancy. She admitted that she never knew she was menstruating except from the sign of blood. When I was called to attend her, she had absolutely no sign of labour except a slight bloody discharge; and from the be-

ginning to the close of the labour she had no pain whatever until the vulva was distended. At that time he thought that if a woman could have a labour absolutely painless, and could have a menstrual life without pain, it must be due to the fact that the uterus was faultily innervated. On the other hand, when a woman has dysmenorrhœa, it might be on account of the other extreme—that there is excessive innervation, perhaps an increased number of nerve-endings; and that, to my mind is often the cause—an increased nerve supply. In the treatment, every case is one unto itself. On the mechanical theory dilatation is indicated, but he thought it was very exceptionally to be used. Generally, he thought that tonics, exercise, and perhaps particular drugs are what must be used. In the States he had heard his friends bemoan that their gynæcological practice had fallen off. It had been rather immaterial to him, as he had so little to do in that way; but he had traced the reason to the bicycle. This is exceedingly common among American girls, and they also go in for athletics, and belong to tennis and golfing clubs, as well as taking walks, where formerly they would ride on a street car. It was these exercises that were improving women, and lessening the amount of dysmenorrhœa. As for the examination of the unmarried, yesterday he had heard a lecture given by Dr Halliday Croom, who had made a remark on the subject with which he was in perfect accord—namely, that a man was criminally liable when he examined an unmarried woman except under two conditions: one where there was a strong presumption of pregnancy, and that it was necessary that he should tell her whether she was or was not pregnant; and the other, where there was some positive reason on account of her not improving under long continued general treatment, and the examination was made as a last resort. In the congestive form, his friend, Dr Steyn of Chicago, had advocated the douche. He thought that all agreed that the douche, as ordinarily taken—the woman in sitting posture, and the vessel suspended as high as her head—was of little value. She should be on her back, and the douche should go in slowly, and for a considerable period. Dr ——— has gone further, and instituted a douche, to which the nurses have applied his name. The

woman is put on a bed-pan, and there is a large vessel above from which the water slowly goes into the vagina. There is a little contrivance over the vulva to keep the water back, and a small orifice to allow it to flow out gradually. This was kept up for an hour; and he found it particularly useful in those cases where there was an inflammatory process going on.

Dr Ballantyne would not detain the meeting for more than a minute. The generalisations which came into his mind on thinking over the subject were three, and these were suggested by his own experience during the last few years. One was that we must treat the dysmenorrhœa, and must keep on treating it. What he meant was, that there was nothing worse for oneself or the patient than to throw the thing up. It may be that you have to say that the best treatment is neither medicinal nor operative, but at all events it is therapeutical, it is under your guidance and orders, and therefore better than setting the patient adrift. She will have treatment of some kind —perhaps from a quack source. The second point was, that the more correctly he diagnosed, the more certainly he marched to success in treatment. He believed that, with the consent of the patient and that of her parents, they ought to make a diagnosis in every case, and adopt the treatment which follows from it. He thought that anything short of that was not acting up to their duty as gynæcologists. The third point was, perhaps, rather a drop from these—that the enema syringe was one of the best methods for treating every case.

The President only wished to make one or two remarks. The first was in reference to a matter which had been spoken of by Dr Connel and Dr Foulis, and had also been referred to by Dr Haultain. It was as to the use of alcohol. He was perfectly certain that more appalling results than sometimes arose from its administration to young women suffering from painful menstruation could hardly be conceived. He was convinced that the great majority of the alcoholic cases that we have to deal with in daily practice arose through young women being treated by their mothers with alcohol during their menstrual periods. Some years ago he was more than shocked by an attitude assumed in some lectures by an eminent London gynæcologist in which he recommended, as an ordinary

domestic remedy, which he had found satisfactory, that girls of tender years—17 to 20—suffering from symptoms of spasmodic dysmenorrhœa, should have administered to them a glass of hot gin and water for the first two nights of the period. Anything more unwise as a matter of advice on the part of a man of very great eminence was inconceivable to his mind. He thought that if the discussion served no other purpose than to fix on their minds the danger of this remedy for dysmenorrhœa, the time would be well spent. As regards local examination, he thought they were all agreed that the proceeding should be deferred until one was definitely certain that it was necessary. After that he thought it was the worst possible practice to defer it longer. If one had a patient who had been trying for months all the remedies recommended, from salicylate of soda upwards or downwards, and who had failed to obtain any reasonable amount of relief—the girl looking forward to suffering for forty-eight hours or more at each period; then it was surely time to assume that there might be some local cause, and that good results might be expected by treating it. He did not believe that any damage could be done to a girl's feelings by examination under an anæsthetic, at all comparable to the constant dread and anxiety with which the patient must look forward to these monthly recurring attacks. He had come across many women who had expressed the greatest gratitude for a comparatively slight operation; an amount of gratitude that might seem unreasonable unless we put ourselves in the same position. By a dose of chloroform and something done of which they knew nothing, their sufferings were completely and usually permanently relieved. Therefore he considered there was a time when local examination should be carried out, and the indications for treatment acted upon. These were points which he thought the discussion had to a large extent definitely cleared up. He would now ask Dr Haultain to make any reply which he thought necessary.

Dr Haultain said that after the chairman's remarks he had really nothing to reply; he had practically taken the words out of his mouth, and had focussed the matter down to a point with which he thoroughly agreed, and which required no further

talking about. There were one or two matters which had been said to which he might allude. To take, in the first place, the causes of the condition. He believed that in the vast majority of cases dysmenorrhœa was due to local causes; he did not believe very much in constitutional conditions, but constitutional conditions may set up local inflammation, and if we can by treating the constitution remove these inflammations, good and well; but if, on the other hand, this is not sufficient, then they must tackle the local cause, and the only way he knew of tackling the local cause was by local treatment. Dr Holmes had expressed his disbelief in the mechanical theory. He (the speaker) in his paper mentioned that he believed in it absolutely. He held that the proof of the pudding was in the eating of it; and when he found that he could cure a person of her dysmenorrhœa by dilating the cervix, he was perfectly convinced that the pain had been due to some obstruction in that cervix. He knew all the other various theories, but must say that he could find no cause which was so practical, and which gives way to treatment so easily as the uterine cause of obstruction. Lastly, as to patients having to return for re-dilatation—there were no doubt a certain number of cases in which dysmenorrhœa does return; but so pleased are these patients with the relief afforded them by the operation, that they are only too ready to return to have it done again. He thought this was one of the greatest proofs of the necessity for the operation in certain cases, instead of temporising by giving drugs and other means. Further, he would not like it to be thought that the patients always have to return. So far as his experience went, he was pretty sure that nothing like 50 per cent. of them did—the others were totally and absolutely cured. In the majority of instances they have not to return for operation.

INDEX.

Abdominal section for large solid intra-ligamentary tumour, 14.
Albuminuria, multiple pregnancy, papyraceous fœtus, and placenta prævia, 53.

Ballantyne, Dr J. W., shows a teratoma, 52; on Dr James Ritchie's paper, 59; on Dr Hart's paper, 69; shows a fœtus with absence of radii and deformity of thumbs, an anencephalic fœtus, photographs of teratological phenomena, 70; on Dr Macvie's paper, 82; on Professor Simpson's paper, 90; on the chronology of ante-natal life, 94; on clinical note of a case of vulvar hænatoma, 137; shows frozen sections and photographs of fœtal iniencephaly; a uromelic sympodial fœtus; knot on the umbilical cord, 144; on Dr Brewis' paper, 195; on clinical note on a case of eclampsia at the sixth month of pregnancy, treated by saline infusion and veratrum viride, 196; on treatment of dysmenorrhœa, 231.
Barbour, Dr, on Dr Macvie's paper, 83; on Professor Simpson's paper, 90; on Dr Haultain's paper, 126; on the set of the pelvis in the body (variation in the inclination of the brim apart from posture), and its obstetrical significance, 153; on treatment of dysmenorrhœa, 224.
Basilyst improved, 70.
Bladder and kidneys from a case of suppression of urine, 125.
Brewis, Dr N. T., on large solid intra-ligamentary tumour removed by abdominal section, 14; on Professor Kynoch's paper, 36; shows gravid uterus removed by pan-hysterectomy at the fifth month for cancer of the cervix, 142; shows a uterus removed by sub-peritoneal hysterectomy after Cæsarean section at term, 142; shows uterus removed by vaginal hysterectomy for cancer of body and cervix; pyosalpinx removed by vaginal section, 143; fibroid tumour of the uterus removed by sub-peritoneal hysterectomy; an enlarged vermiform appendix, 180; on a case of Cæsarean section followed by sub-peritoneal hysterectomy, 186; on cleansing the peritoneum during cœliotomy, 190.

Cæsarean section followed by sub-peritoneal hysterectomy, 186.
Chronology of ante-natal life, 94.
Church, Dr, on Prof. Kynoch's paper, 38; on Dr James Ritchie's paper, 59; on treatment of dysmenorrhœa, 214.
Chylous ascites, 99.
Cleansing the peritoneum during cœliotomy, 190.
Connel, Dr, on treatment of dysmenorrhœa, 220.
Craig, Dr Wm., makes annual statement as treasurer, 1.
Croom, Dr J. Halliday, gives valedictory address, 2; on Dr Brewis' paper, 19; on chylous ascites, with an illustrative case, 99; on a complicated case of double ovariotomy in a girl aged eighteen, 104; on Dr Jardine's paper, 113.
Cullen, Dr, shows a slough of the cervix, radiographs of polydactyly, 125.
Cystoma, ovarian, 143.

Delivery by basilysis, 83.
Differentiation of connective tissue in the human fœtus, 60.

Duverney's gland, large cyst of, 21.
Dysmenorrhœa, discussion on treatment of, 206.

Eclampsia at the sixth month of pregnancy, 196.
Eclampsia, five cases treated by saline infusion, 108.
Eclampsia, puerperal, 71.
Election of honorary fellows, 206.
Election of office-bearers, 2.
Election of ordinary fellows. 2, 19, 52, 94.
Extra-uterine gestation, 178.

Fehling, Prof., elected an honorary fellow, 206.
Ferguson, Dr J. Haig, shows a large cyst of Duverney's gland, 21; on Prof. Simpson's paper, 90; on Dr Haultain's paper, 127; shows dermoid tumour of ovary, 145; shows uterus removed by vaginal hysterectomy for cancer, 179.
Fibro-adenoma removed from the vagina, 143.
Fibroid tumour of the uterus, 19, 70, 177, 180.
Fœtus, anencephalic, 20, 70, 125.
Fœtus, cyclops, 126.
Fœtus, uromelic sympodial, 144.
Fœtus with absence of radii and deformity of thumbs, 70.
Foulis, Dr, shows a new handle for axis traction forceps, 126; on Dr Haultain's paper, 127; shows photographs of amnion and umbilical cord, 181; on treatment of dysmenorrhœa, 218.
Frozen sections and photographs of fœtal iniencephaly, 144.

Gestation sac and fœtus, ruptured extra-uterine, 143.

Hæmatoma, vulvar, 137.
Hairpin removed from the female bladder, 20.
Handle, new, for axis traction forceps, 126.
Hart, Dr D. Berry, on the cause of the differentiation of connective tissue in the human fœtus, 60; on the nomenclature of transverse presentation and of version, with remarks on the choice of the leg seized, 146.
Haultain, Dr F. W. N., on Prof. Kynoch's paper, 37; on Dr Milne Murray's paper, 45; on Dr Paterson's paper, 51; on Dr Macvie's paper, 83; on pathological amenorrhœa from other than constitutional causes, with illustrative cases, 113; shows a ruptured extra-uterine gestation sac and fœtus, a blood cyst from the canal of Nuck, a fibro-adenoma removed from the vagina, 143; shows a small simple ovarian cyst with which was associated 5¼ gallons of ascitic fluid, 143; on Dr Brewis' papers, 190, 195; opens discussion on treatment of dysmenorrhœa, 206.
Head of child delivered by basilysis, 70.
Holmes, Dr, on treatment of dysmenorrhœa, 229.
Hydatid mole, 70.

Intra-ligamentary tumour, large, solid, removed by abdominal section, 14.

Jardine, Dr Robert, on notes of five cases of eclampsia treated by saline infusion, 108.

Kerr, Dr Malcolm, on treatment of dysmenorrhœa, 222.
Knot on umbilical cord, 144.
Kraurosis vulvæ, 202.
Kynoch, Prof. J. A. C., on vaginal cœliotomy, 21; on kraurosis vulvæ, 202; on treatment of dysmenorrhœa, 216.

Lackie, Dr J. Lamond, shows hairpin removed from the female bladder, 20; on Dr Milne Murray's paper, 48; shows bladder and kidneys from a case of suppression of urine, 125; shows an early extra-uterine gestation, 278; on suppression of urine following cystitis, 181.
Levurine, bottle of, 70; note on, 91.

Mackie, Dr S., on a case of puerperal eclampsia, having a peculiar puerperal history, 71.

Murray, Dr R. Milne, shows a double uterus, 19; on pyosalpinx removed by laparotomy in the early puerperium, 38; shows specimen of cyclops fœtus, 126; on treatment of dysmenorrhœa, 231.
Myxomatous ovum, specimen of, 70.

Nairne, Dr Stuart, shows a uterus with placenta by Cæsarean section, 180.
Nomenclature of transverse presentation and of version, 146.

Ovariotomy, double, in a girl of eighteen, 104.
Ovary, dermoid tumour of, 145, 176.

Paterson, Dr G. W. Simla, on case of sudden death following labour, 46.
Paterson, Dr Keppie, shows specimen of myxomatous ovum, 70.
Pathological amenorrhœa, 113.
Photographs of amnion and umbilical cord, 181.
Placenta bipartite, 125.
Pyosalpinx removed by laparotomy, 38; removed by vaginal section, 143.

Radiographs of polydactyly, 125.
Ritchie, Dr James, on albuminuria, multiple pregnancy, papyraceous fœtus, and placenta prævia, 53; on Dr Croom's paper, 104; on Dr Jardine's paper, 113; on Dr Haultain's paper, 129; on Dr Lackie's paper, 186; on treatment of dysmenorrhœa, 226.
Robertson, Dr Aitchison, on Dr Haultain's paper, 126.
Royal Medical Benevolent College, subscription to, 142.

Sängu, Prof., elected an honorary fellow, 206.
Set of the pelvis in the body and its obstetrical significance, 153.
Simpson, Professor A. R., shows a large fibroid tumour removed by supra-vaginal hysterectomy, 19; on anencephalic fœtus, 20; on Prof. Kynoch's paper, 35; on Dr Milne Murray's paper, 45; shows specimens from case of Cæsarean section, 52; on Dr Jas. Ritchie's paper, 58; on Dr Hart's paper, 68; shows two fibroid uteri removed by pan-hysterectomy, specimen of hydatid mole, a bottle of levurine, an improved basilyst, head of child delivery by basilysis, 70; on Dr Macvie's paper, 83; on delivery by basilysis, 83; on note on levurine, 91; shows an anencephalic fœtus, a bipartite placenta, 125; on vaporisation (atmokausis) of the endometrium, 131; on Dr Hart's paper, 152; shows a dermoid cyst, two fibroid uteri removed by pan-hysterectomy, 176; on Dr Barbour's paper, 176.
Slough of the cervix, 125.
Sudden death following labour, 46.
Suppression of urine following cystitis, 181.

Teratoma, 52.

Uterus, double, 19.
Uterus, gravid removed by pan-hysterectomy at fifth month for cancer of body of cervix, 142.
Uterus removed by hysterectomy after Cæsarean section, 142.
Uterus removed by vaginal hysterectomy for cancer, 143.
Uterus removed by vaginal hysterectomy for cervical cancer, 179.
Uterus with placenta removed by Cæsarean section, 180.

Vaginal cœliotomy, 21.
Valedictory address by Dr J. Halliday Croom, 2.
Vaporisation (atmokausis) of the endometrium, 131.
Vermiform appendix, 180.

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lqel
342